Matanuska-Susitna Borough
Timber Inventory
2006
1989 MSB Forest Management Plan

- 17 Forest Management Units (FMU)
- 138,000 acres classified forest land
- Approximately 84,700 acres Commercial Timber Land (CFL)
2006 MSB Hired Sanders Forestry Consultants

• To provide a statistically based, stand-level inventory of CFL within the FMU’s

• Conduct an inventory of commercial timber on MSB land

• Provide a market analysis, a written report and a GIS map.
Inventory Results Sought

• Focus on 13 FMU’s and Provide:
• timber volume
• Timber value
• Annual allowable cut (AAC)
• Assess forest health
• Other forest use values
• **MSB TIMBER INVENTORY—FIELD CRUISE INSTRUCTIONS**
• Prepared by Richard Sanders, Cal Kerr, Mike Cooney, foresters
• July, 2006
• Cruise Objectives
• The following timber cruise instructions are designed to meet the objectives of a statistically based inventory of commercial forest lands required under the MSB, Timber Survey, Contract Agreement #06-087, Scope of Services.
• **Stratification of Sample Population**
• MSB commercial forest land was classified through photo interpretation of low-level aerial photography into distinct timber types based on species, size class, and stocking density. See Table 1, below.
• Commercial forest timber types (stands comprised of commercially important species that are pole-timber and saw-timber size) were stratified into sampling strata based on species and size class. Each sample strata is color coded on the preliminary timber type maps. Non-forest, non-commercial forest and commercial seedling and sapling sized timber types will not be field sampled, but will be verified as they are encountered in the field.
Sample Plot Distribution
Approximate acreage of each sample stratum was calculated (by GIS map measurement) using the preliminary timber type maps. Originally, there were six sampling strata, but because the combined acreage of the White Spruce Saw-timber and the White Spruce Pole-timber strata was ___ acres (approximately ---% of the total CFL), for sampling purposes, these strata were combined with sample strata 3. and 4. Sample plots will be distributed in each stratum on a proportional basis.) as follows in Table 1:

<table>
<thead>
<tr>
<th>Sample Strata</th>
<th>Stratum Acres</th>
<th>% of CFL</th>
<th>Number of Plots</th>
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</thead>
<tbody>
<tr>
<td>3. Mixed Forest Saw-timber</td>
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<tr>
<td>4. Mixed Forest Pole-timber</td>
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<tr>
<td>5. Hardwood Saw-timber</td>
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<tr>
<td>6. Hardwood Pole-timber</td>
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<tr>
<td><strong>TOTALS</strong></td>
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</tbody>
</table>

Sample Plot Location
Sample plot centers will be located along transect lines at intervals of 4 chains (264 feet). Transect lines will be located on cardinal or near cardinal direction and perpendicular to slope. There will be no more than 15 sample points per stand on any transect line. Plots should be located within 2 miles of four-wheel drive roads. General plot locations will be submitted for MSB Project Manager review and approval prior to field sampling. Plot locations will be referenced and marked in the field and referenced on final GIS timber type maps.
Variable Radius Sample Plots

All sample plots will be variable radius plots; all plots will be “measure” plots. Tree tally on each plot will be determined using a basal area factor (BAF) angle gauge on the Spiegel Relaskop. At each plot, an appropriate BAF (40, 20, 10, or 5) will be selected to yield at least 3 sample trees. Using multiple basal area factors ensures optimum sampling of 3-6 trees per plot, reduces tree count errors, and reduces sample points with either excessive tree tally or no tally. The requirement will be: If a 40 BAF does not select at least 3 trees for measurement, then the cruiser will increase the plot radius factor (20, 10, or 5 BAF) until 3 or more trees are selected for measurement.

Sample Tree Measurements

Tree measurements by species will include: D4H (diameter at 4-feet above stump height), form factor (tree taper), bole or stem height to a merchantable top diameter, variable log lengths for grade and sort (sorts will address local markets) and estimated log segment defect. Tree age class and condition will also be recorded to provide statistically based data describing forest health, condition, and stand structure.

Recorded Data:

PE (BAF Factor)

Record the BAF (40, 20, 10, or 5) used to determine the tree tally on the plot. Count and record all “in” trees 5.0 inches and greater at D4H.

Type No.

Record the number corresponding to the sample strata (3, 4, 5 or 6) for the plot.

Plot No.

Along each transect, plots will be numbered consecutively. Plot center locations will be shown on the aerial photos for eventual transfer to the final GIS maps.
• **FP (Form Point or Sighting Point)**
  All trees are tallied by sighting at D4H. Record 04 in this column for each sample tree.

• **FF (Form Factor)**
  Measure and record the diameter outside bark at 16 feet, to the nearest inch.

• **TD (Top Diameter)**
  Measure and record (alpha code) the merchantable top diameter (outside bark) for each sample tree using the following coding convention; 3” = C, 4” = D, 5” = E, etc.

• **Bol Len (Bole Length)**
  Measure and record the merchantable height (length of bole between the stump and the merchantable top diameter) to the nearest foot.

• **T1 (Tree Vigor Rating)**
  For each sample tree, determine and record the tree classification code that best describes the tree. Field data will be analyzed and used to describe overall stand and forest condition.
• 1 Growing Stock Tree
  Tree is a commercial species, contains merchantable product(s), has no damage/defect or has minor damage/defect that will not affect growth or survival, tree is healthy as evidenced by growth rate and crown condition. If a mature tree, is still accruing annual net volume and is expected to survive at least the next 10 years.

• 2 High Risk Tree
  Tree is a commercial species, contains merchantable product(s), but has defect/damage that reduces merchantable volume and affects the tree’s ability to continue growing, and/or tree is not accruing annual net volume. Defect and damage are expected to cause increasing volume losses or result in tree mortality within the next 10 years.

• 3 Cull Tree
  Tree is live, tree is a non-commercial species, or if a commercial species is cull (will not produce a forest product) due to rot (rotten cull) or rough form (sound cull).

• 4 Mortality
  Tree is a commercial species, and tree is dead; tree is either standing or down.
• Commercial Timber Types were consolidated into the following 6 strata:
• Strata #1 All species poletimber closed 9596 acres 258 sample plots
• Found commonly throughout the FMUs. Kashwitna River had considerable amount of these forest types primarily in the southern block and remote east half of the northern block.
• Strata #2 All species poletimber open 1506 acres 128 sample plots
• An unusual strata of limited acreage primarily composed of partially cut harvested acres and marginally commercial stands found in Bunco Hills with a dense brush understory. Other than partially harvested stands, these timber stands are small in size, scattered and often remote or inaccessible by foot travel. Consequently, less than the 200 sample points were taken in this stratum.
• Strata #3  Hardwood sawtimber closed  2589 acres  127 sample plots
• Primarily identified in the Fish Creek FMU where several large contiguous stands exist. A small proportion of this acreage is composed of river bottom cottonwood types on islands in Whiskers Creek (west) and North Bartlett Hills. These cottonwood types were sampled in the Susitna River Corridor.
• Strata #4  Hardwood sawtimber open  2936 acres  214 sample plots
• Generally composed of old growth, open grown Birch stands on rolling hills with a understory of grass and alders in Chijuk, Whiskers and Bunco Hills.
• Strata #5  Mixed Forest sawtimber closed 41580 acres 297 sample plots
• The predominate stratum that occupies nearly 60% of the acreage and common in all FMUS except the Matanuska River (past harvests) and Bunco Hills.
• Strata #6  Mixed Forest sawtimber open 15091 acres 220 sample plots
• Very similar to the above forest except for density.
• Note: At this time acreage figures are preliminary and undergoing a final edit.