Observatory Mesa Summary

On November 16 2016, 36 NAU Forestry students conducted a simple inventory of a 490-acres area (Figure 1) west of Flagstaff located on Observatory Mesa. The primary objectives of this exercise were to provide the students with experience implementing fixed-area plot sampling and estimating current (and previous) stand conditions and to identify and measure site trees to determine site index (Minor 1964). Students collected data on a total of 45 (of 53 planned) 1/20th fixed-area plots (on a 10chx10ch grid) and 45 site index trees. To estimate previous condition, student predicted dbh form existing stump diameters (Sanchez Meador et al. 2010) and added these values to those observed for contemporary live trees. Table 1 and Figure 2 provide estimates of cubic foot volume per acre, basal area per acre and tree density (both pretreatment and posttreatment), as well as site index and an associated diameter distribution:

Figure 1: Location and planned inventory design map.
Table 1: Stand Attributes pre and posttreatment for a 490-acres area west of Flagstaff located on Observatory Mesa. Summaries based on n = 45 1/20th fixed-area plots.

<table>
<thead>
<tr>
<th>Estimate</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>CV</th>
<th>95% Confidence limits</th>
<th>Sampling error in Percent</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretreatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density (trees ac(^{-1}))</td>
<td>146.67</td>
<td>93.71</td>
<td>64%</td>
<td>118.51 - 174.83</td>
<td>19.2% 28.2</td>
<td></td>
</tr>
<tr>
<td>Volume (ft(^3) ac(^{-1}))</td>
<td>2469.58</td>
<td>1118.54</td>
<td>45%</td>
<td>2133.45 - 2805.70</td>
<td>13.6% 336.1</td>
<td></td>
</tr>
<tr>
<td>Basal Area (ft(^2) ac(^{-1}))</td>
<td>127.75</td>
<td>54.4</td>
<td>43%</td>
<td>111.40 - 144.10</td>
<td>12.8% 16.3</td>
<td></td>
</tr>
<tr>
<td>PostTreatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density (trees ac(^{-1}))</td>
<td>76.44</td>
<td>63</td>
<td>82%</td>
<td>57.51 - 95.38</td>
<td>24.8% 18.9</td>
<td></td>
</tr>
<tr>
<td>Volume (ft(^3) ac(^{-1}))</td>
<td>1485.86</td>
<td>1146.54</td>
<td>77%</td>
<td>1141.32 - 1830.40</td>
<td>23.2% 344.5</td>
<td></td>
</tr>
<tr>
<td>Basal Area (ft(^2) ac(^{-1}))</td>
<td>74.47</td>
<td>50.2</td>
<td>67%</td>
<td>59.38 - 89.55</td>
<td>20.3% 15.1</td>
<td></td>
</tr>
<tr>
<td>Site index(_{100}) (ft)</td>
<td>63.62</td>
<td>13.22</td>
<td>-</td>
<td>59.65 - 67.59</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure 2: Pre and posttreatment diameter distributions (2-in classes) for a 490-acres area west of Flagstaff located on Observatory Mesa. Summaries based on n = 45 1/20th fixed-area plots.

References:
