The Link between the Stand Level and the Forest (Landscape) Level which occurs in Timber Supply Analysis

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Timber Supply Analysis



Timber Supply – Base Case Examples







Harvest Flow



LINK #1

Culmination of Mean Annual Increment



Culmination of Mean Annual Increment



Changing CMAI



LINK #2

Time to Reach Merchantability

Time to Reach Merchantability (Minimum Harvestable Age)

| | 1 | Vo | Lume | MAI | Volume | MAI | BA | DBHg | Trees | CC I | Volume | DBHg |
|-------|------|-------|-------|---------|---------|---------|---------|------|--------|---------|-------------|------------|
| | | (m3, | /ha) | (m3/ha) | (m3/ha) | (m3/ha) | (m2/ha) | (cm) | (#/ha) | (%) | (m3/ha) | (cm) |
| TIPSY | Top | | | | i | | | | | | Crop | Crop |
| Age | Ht | Gross | Merch | Merch | Merch | Merch | | | | A11 | Max 250/ha | Max 250/ha |
| (yr) | (m) | 0.0+ | 12.5+ | 12.5+ | 17.5+ | 17.5+ | 0.0+ | 0.0+ | 0.0+ | Trees | 12.5+ | 12.5+ |
| 0.0 | 0.1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.0 | 1357 | 1 | 0 | 0.0 |
| 5.0 | 1.2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.0 | 1331 | 6 | 0 | 0.0 |
| 10.0 | 2.5 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.4 | 1303 | 22 | 0 | 0.0 |
| 15.0 | 4.1 | 3 | 0 | 0.00 | 0 | 0.00 | 1 | 3.7 | 1273 | 46 | 0 | 0.0 |
| 20.0 | 5.8 | 9 | 0 | 0.00 | 0 | 0.00 | 3 | 5.9 | 1245 | 67 | 0 | 15.0 |
| 25.0 | 7.5 | 23 | 2 | 0.08 | 0 | 0.00 | 8 | 8.9 | 1223 | 77 | 2 | 15.1 |
| 30.0 | 9.1 | 44 | 17 | 0.58 | 3 | 0.10 | 13 | 11.7 | 1207 | 80 | 11 | 15.8 |
| 35.0 | 10.5 | 68 | 37 | 1.05 | 11 | 0.32 | 18 | 13.8 | 1193 | 81 | 17 | 17.6 |
| 40.0 | 11.8 | 89 | 56 | 1.41 | 26 | 0.65 | 22 | 15.2 | 1183 | 82 | 26 | 20.2 |
| 45.0 | 13.0 | 118 | 83 | 1.85 | 53 | 1.18 | 26 | 16.6 | 1176 | 83 | 34 | 21.2 |
| 50.0 | 14.1 | 146 | 109 | 2.18 | 80 | 1.61 | 29 | 17.8 | 1170 | 83 | 41 | 22.2 |
| 55.0 | 15.1 | 173 | 134 | 2.44 | 108 | 1.96 | 32 | 18.7 | 1165 | 83 | 53 | 23.9 |
| 60.0 | 16.0 | 198 | 157 | 2.61 | 132 | 2.20 | 34 | 19.4 | 1161 | 82 | 62 | 25.2 |
| 65.0 | 16.8 | 218 | 174 | 2.68 | 151 | 2.32 | 36 | 19.9 | 1155 | 82 | 71 | 25.9 |
| 70.0 | 17.5 | 236 | 190 | 2.71 | 168 | 2.39 | 38 | 20.4 | 1150 | 82 | 75 | 26.2 |
| 75.0 | 18.2 | 252 | 204 | 2.72 | 183 | 2.44 | 39 | 20.8 | 1144 | 82 | 80 | 26.5 |
| 80.0 | 18.8 | 268 | 218 | 2.73 | 198 | 2.48 | 40 | 21.1 | 1137 | 82 | 86 | 27.0 |
| 85.0 | 19.3 | 283 | 231 | 2.71 | 212 | 2.50 | 41 | 21.4 | 1131 | 81 | 92 | 27.4 |
| 90.0 | 19.8 | 296 | 242 | 2.69 | 225 | 2.50 | 42 | 21.7 | 1125 | 81 | 96 | 27.7 |
| 95.0 | 20.3 | 308 | 252 | 2.66 | 236 | 2.48 | 42 | 22.0 | 1116 | 81 | 101 | 28.1 |
| 100.0 | 20.7 | 319 | 261 | 2.61 | 245 | 2.45 | 43 | 22.2 | 1106 | 81 | 107 | 28.4 |
| 105.0 | 21.1 | 329 | 269 | 2.57 | 254 | 2.42 | 43 | 22.5 | 1097 | 80 | 111 | 28.8 |
| 110.0 | 21.4 | 338 | 277 | 2.52 | 262 | 2.38 | 44 | 22.7 | 1088 | 80 | 115 | 29.1 |
| 115.0 | 21.8 | 347 | 284 | 2.47 | 269 | 2.34 | 44 | 22.9 | 1080 | 80 | 119 | 29.4 |
| 120.0 | 22.1 | 354 | 290 | 2.42 | 276 | 2.30 | 45 | 23.0 | 1072 | 80 | 122 | 29.6 |
| 125.0 | 22.3 | 362 | 296 | 2.37 | 282 | 2.25 | 45 | 23.2 | 1059 | 80 | 126 | 29.8 |
| 130.0 | 22.6 | 370 | 301 | 2.31 | 287 | 2.21 | 45 | 23.4 | 1047 | 79 | 131 | 30.0 |









LINK #3

Time to Reach Non-timber Objective Constrain

Non-timber Objectives

- Visual
- Seral
- Ungulate winter range
- Community Watershed
- Cut block adjacency

Modelled Constraints

Maximum Disturbance - do not exceed X% less than Y e.g., <10% of land base must be less than 4.5 m height

Minimum Retention - at least X% must be greater than Y e.g., >60% of must meet thermal cover requirements

Time to Reach Non-timber Objective

| | 1 | Volume | | MAI | Volume | MAI | BA | DBHg | Trees | CC I | Volume | DBHg |
|-------|------|--------|------------|---------|---------|-------------|---------|------|--------|---------|-------------|------------|
| | | (m3, | /ha) | (m3/ha) | (m3/ha) | (m3/ha) | (m2/ha) | (cm) | (#/ha) | (%) | (m3/ha) | (cm) |
| TIPSY | Top | | i | | i i | | i | i i | | | Crop | Crop |
| Age | Ht | Gross | Merch | Merch | Merch | Merch | l i | I I | | A11 | Max 250/ha | Max 250/ha |
| (yr) | (m) | 0.0+ | 12.5+ | 12.5+ | 17.5+ | 17.5+ | 0.0+ | 0.0+ | 0.0+ | Trees | 12.5+ | 12.5+ |
| 0.0 | 0.1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.0 | 1357 | 1 | 0 | 0.0 |
| 5.0 | 1.2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.0 | 1331 | 6 | 0 | 0.0 |
| 10.0 | 2.5 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.4 | 1303 | 22 | 0 | 0.0 |
| 15.0 | 4.1 | 3 | 0 | 0.00 | 0 | 0.00 | 1 | 3.7 | 1273 | 46 | 0 | 0.0 |
| 20.0 | 5.8 | 9 | 0 | 0.00 | 0 | 0.00 | 3 | 5.9 | 1245 | 67 | 0 | 15.0 |
| 25.0 | 7.5 | 23 | 2 | 0.08 | 0 | 0.00 | 8 | 8.9 | 1223 | 77 | 2 | 15.1 |
| 30.0 | 9.1 | 44 | 17 | 0.58 | 3 | 0.10 | 13 | 11.7 | 1207 | 80 | 11 | 15.8 |
| 35.0 | 10.5 | 68 | 37 | 1.05 | 11 | 0.32 | 18 | 13.8 | 1193 | 81 | 17 | 17.6 |
| 40.0 | 11.8 | 89 | 56 | 1.41 | 26 | 0.65 | 22 | 15.2 | 1183 | 82 | 26 | 20.2 |
| 45.0 | 13.0 | 118 | 83 | 1.85 | 53 | 1.18 | 26 | 16.6 | 1176 | 83 | 34 | 21.2 |
| 50.0 | 14.1 | 146 | 109 | 2.18 | 80 | 1.61 | 29 | 17.8 | 1170 | 83 | 41 | 22.2 |
| 55.0 | 15.1 | 173 | 134 | 2.44 | 108 | 1.96 | 32 | 18.7 | 1165 | 83 | 53 | 23.9 |
| 60.0 | 16.0 | 198 | 157 | 2.61 | 132 | 2.20 | 34 | 19.4 | 1161 | 82 | 62 | 25.2 |
| 65.0 | 16.8 | 218 | 174 | 2.68 | 151 | 2.32 | 36 | 19.9 | 1155 | 82 | 71 | 25.9 |
| 70.0 | 17.5 | 236 | 190 | 2.71 | 168 | 2.39 | 38 | 20.4 | 1150 | 82 | 75 | 26.2 |
| 75.0 | 18.2 | 252 | 204 | 2.72 | 183 | 2.44 | 39 | 20.8 | 1144 | 82 | 80 | 26.5 |
| 80.0 | 18.8 | 268 | 218 | 2.73 | 198 | 2.48 | 40 | 21.1 | 1137 | 82 | 86 | 27.0 |
| 85.0 | 19.3 | 283 | 231 | 2.71 | 212 | 2.50 | 41 | 21.4 | 1131 | 81 | 92 | 27.4 |
| 90.0 | 19.8 | 296 | 242 | 2.69 | 225 | 2.50 | 42 | 21.7 | 1125 | 81 | 96 | 27.7 |
| 95.0 | 20.3 | 308 | 252 | 2.66 | 236 | 2.48 | 42 | 22.0 | 1116 | 81 | 101 | 28.1 |
| 100.0 | 20.7 | 319 | 261 | 2.61 | 245 | 2.45 | 43 | 22.2 | 1106 | 81 | 107 | 28.4 |
| 105.0 | 21.1 | 329 | 269 | 2.57 | 254 | 2.42 | 43 | 22.5 | 1097 | 80 | 111 | 28.8 |
| 110.0 | 21.4 | 338 | 277 | 2.52 | 262 | 2.38 | 44 | 22.7 | 1088 | 80 | 115 | 29.1 |
| 115.0 | 21.8 | 347 | 284 | 2.47 | 269 | 2.34 | 44 | 22.9 | 1080 | 80 | 119 | 29.4 |
| 120.0 | 22.1 | 354 | 290 | 2.42 | 276 | 2.30 | 45 | 23.0 | 1072 | 80 | 122 | 29.6 |
| 125.0 | 22.3 | 362 | 296 | 2.37 | 282 | 2.25 | 45 | 23.2 | 1059 | 80 | 126 | 29.8 |
| 130.0 | 22.6 | 370 | 301 | 2.31 | 287 | 2.21 | 45 | 23.4 | 1047 | 79 | 131 | 30.0 |

Implied Rotation Age

e.g., <10% of land base must be less than 4.5 m height

if 4.5 m reached in 17 years

IRA = 1/0.1 * 17 = 170 years

Implied Rotation Age Above Age at CMAI



LINK #4

Stand Initiation Characteristics







