MOSSY ROCK 6YEAR PLANTATION, THINNING TO 200 TPA AT 7 YEARS
O R G A N O N

Oregon Growth Analysis and Projection System
Growth & Yield Model for
Red Alder Plantations

RAP VERSION, EDITION 9.0
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This model was funded by:
OSU Hardwood Silviculture Cooperative (HSC)

Tree Data File: STINPLT6
Stand Identification: MOSSYROCK 6YR
Number of Plots/Points: 5
Number of Sample (obs.) Trees: 27

Red Alder Site Index = 80.0
Douglas-fir Site Index =135.6
Breast height stand age = 6
Total stand age = 7

--> --> --> --> --> --> W A R N I N G <-- <-- <-- <-- <-- <--
50 SAMPLE TREES IS THE MINIMUM RECOMMENDED !!!
--> --> --> --> --> --> W A R N I N G <-- <-- <-- <-- <-- <--

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======== RESIDUAL ========== C U T  Y I E L D =========== REMOVAL ===========
 Red Alder   7| 200.0    28.1    548.     214.|  340.0    33.0    610.1      0.0

   TOTALS:      200.0    28.1    548.     214.   340.0    33.0    610.1       0.
              QUADRATIC MEAN DIAMETER:    5.1    RELATIVE DENSITY INDEX:  0.229
            SUM % LARGEST CROWN AREAS:   40.7      HEIGHT OF 40 LARGEST:   44.3

========= ENDING ======= R E S I D U A L  Y I E L D ======   1-YR CHANGE ======
 Red Alder  30| 196.4   114.3   4567.   14404.|   -0.6     2.1    135.5    155.3

   TOTALS:      196.4   114.3   4567.   14404.    -0.6     2.1    135.5     155.
 MORTALITY: Red Alder                              0.6     0.2      9.4      34.
                  TOTAL MAI:    173.     480.          PAI:      135.5     155.
                 R ALDER MAI:    173.     480.          PAI:      135.5     155.
              QUADRATIC MEAN DIAMETER:   10.3    RELATIVE DENSITY INDEX:  0.681
            SUM % LARGEST CROWN AREAS:   35.9      HEIGHT OF 40 LARGEST:   90.2
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R E S I D U A L  L O G  T A B L E  (TOTAL 30  YEARS)
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LOG LENGTH: 30 feet MIN LOG LENGTH: 8.0 feet TOP DIAM: 5.0 inches

| Top Diameter | Red Alder Logs | Red Alder Vol | Douglas-fir Logs | Douglas-fir Vol | W. Hemlock Logs | W. Hemlock Vol | Other Conifer Logs | Other Conifer Vol |
|---|---|---|---|---|---|---|---|---|
| 4 - 6" | 196.4 | 4768.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6 - 8" | 136.5 | 5969.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8 - 10" | 59.9 | 3666.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| T O T A L S | | | | | | | | |
| Logs: | 392.8 | | 0.0 | | 0.0 | | 0.0 | |
| Volumes: | 14404.3 | | 0.0 | | 0.0 | | 0.0 | |
| AVG VOLUME: | 36.7 | | 0.0 | | 0.0 | | 0.0 | |

MOSSY ROCK PLANTATION NOT THINNED

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*****************************************************************************
            AT| TREES/            CF    SCRIB | TREES/           CF       SCRIB
  SPECIES   YR|  ACRE     BA     VOL     VOL  |  ACRE    BA      VOL       VOL
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========= ENDING ======= R E S I D U A L  Y I E L D ======   0-YR CHANGE ======
Red Alder   7| 540.0    61.2   1159.     214.|

  TOTALS:      540.0    61.2   1159.     214.
                   TOTAL MAI:    166.      31.
                R ALDER MAI:    166.      31.
              QUADRATIC MEAN DIAMETER:    4.6    RELATIVE DENSITY INDEX:  0.522
            SUM % LARGEST CROWN AREAS:   97.1      HEIGHT OF 40 LARGEST:   44.1


========= ENDING ======= R E S I D U A L  Y I E L D ======   1-YR CHANGE ======
Red Alder  30| 349.0   140.7   5529.   17218.|   -6.6     1.2    111.5     97.2

  TOTALS:      349.0   140.7   5529.   17218.    -6.6     1.2    111.5      97.
MORTALITY: Red Alder                               6.6     1.6     58.9     164.
                   TOTAL MAI:    184.     574.          PAI:      111.5      97.
                R ALDER MAI:    184.     574.          PAI:      111.5      97.
              QUADRATIC MEAN DIAMETER:    8.6    RELATIVE DENSITY INDEX:  0.909
            SUM % LARGEST CROWN AREAS:   45.5      HEIGHT OF 40 LARGEST:   90.1


                R E S I D U A L  L O G  T A B L E  (TOTAL 30  YEARS)
      MOSSYROCK 6YR              [  6-09-2011  11:22 PM ]             Page  1
      LOG LENGTH: 30 feet   MIN LOG LENGTH:  8.0 feet    TOP DIAM:  5.0 inches
  ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÄÄ¿
  ³     Top      ³   Red Alder  ³  Douglas-fir ³  W. Hemlock  ³ Other Conifer³
  ³   Diameter   ³  Logs    Vol ³  Logs    Vol ³  Logs    Vol ³  Logs    Vol ³
  ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
      4 -  6"     384.4   9540.6   0.0      0.0   0.0      0.0   0.0      0.0
      6 -  8"     158.0   6565.9   0.0      0.0   0.0      0.0   0.0      0.0
      8 - 10"      20.0   1111.2   0.0      0.0   0.0      0.0   0.0      0.0
      T O T A L S
            Logs:       562.4            0.0            0.0            0.0
         Volumes:     17217.7            0.0            0.0            0.0
      AVG VOLUME:        30.6            0.0            0.0            0.0
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DRAFT Organon tests with MossyRock plantation data

| | per acre | 2006-2008 Ave. Price | | |
|---|---|---|---|---|
| Mgmnt Scenario | NetValue | NPV | LEV | IRR |
| RAP121 | $6,018 | $916 | $1,192 | 9.0% |
| RAP121Thin | $7,221 | $1,124 | $1,462 | 9.2% |
| MossyRock6yr | $4,805 | $636 | $827 | 8.1% |
| MossyRock6yrThin | $5,173 | $650 | $845 | 7.9% |
| | | | | |
| | | | | |
| | per acre | 2011 Price | | |
| | NetValue | NPV | LEV | IRR |
| RAP121 | $3,740 | $389 | $506 | 7.2% |
| RAP121Thin | $4,526 | $500 | $650 | 7.4% |
| MossyRock6yr | $3,036 | $226 | $294 | 6.4% |
| MossyRock6yrThin | $3,240 | $202 | $263 | 6.2% |
| | | | | |
| | Alder log price assumptions, NW Oregon | | | |
| Organon dia. Class | 2006 | 2007 | 2008 | 2011 |
| 5-6" | $290 | $475 | $450 | $350 |
| 7-8" | $475 | $675 | $500 | $395 |
| 9-10" | $688 | $800 | $600 | $493 |
| 11-12" | $800 | $900 | $725 | $563 |
| 13+ | $825 | $950 | $750 | $580 |
| | | | | |
| | | | | |
| Logging cost: $200/mbf high density, $180/mbf lowdensiy | | | | |
| Interest rate for NPV = 5% | | | | |

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INITIAL PER ACRE STAND TABLE AT 40 YEARS FOR RED ALDER

| DIAM CLASS | ======== E N D I N G ======== TREES/ ACRE | BA | CF VOL | SCRIB VOL | ====== NET 0-YEAR CHANGE ====== TREES/ ACRE | BA | CF VOL | SCRIB VOL |
|---|---|---|---|---|---|---|---|---|
| 4 - 6" | 50.0 | 8.6 | 296. | 482. | | | | |
| 6 - 8" | 60.0 | 19.3 | 661. | 1883. | | | | |
| 8 - 10" | 50.0 | 27.3 | 1118. | 3621. | | | | |
| 10 - 12" | 40.0 | 27.7 | 1148. | 3380. | | | | |
| 12 - 14" | 30.0 | 27.7 | 1196. | 3132. | | | | |
| 14 - 16" | 20.0 | 24.5 | 1072. | 3250. | | | | |
| TOTALS | 250.0 | 135.0 | 5492. | 15748. | | | | |

R E S I D U A L L O G T A B L E (TOTAL 30 YEARS)

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LOG LENGTH: 30 feet MIN LOG LENGTH: 8.0 feet TOP DIAM: 5.0 inches

| Top Diameter | Red Alder Logs | Vol | Douglas-fir Logs | Vol | W. Hemlock Logs | Vol | Other Conifer Logs | Vol |
|---|---|---|---|---|---|---|---|---|
| 4 - 6" | 210.0 | 5692.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6 - 8" | 70.0 | 3161.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8 - 10" | 70.0 | 4393.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10 - 12" | 20.0 | 2500.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| T O T A L S | | | | | | | | |
| Logs: | 370.0 | | 0.0 | | 0.0 | | 0.0 | |
| Volumes: | 15747.8 | | 0.0 | | 0.0 | | 0.0 | |
| AVG VOLUME: | 42.6 | | 0.0 | | 0.0 | | 0.0 | |

R E S I D U A L S T O C K T A B L E

MOSSYROCK 40YR

DATA FILE: STIN40 [ 6-11-2011 9:00 AM ]

| SPECIES | AT YR | ========== ENDING ========== TREES/ ACRE | BA | CF VOL | SCRIB VOL | ========= 0-YR CHANGE ======== TREES/ ACRE | BA | CF VOL | SCRIB VOL |
|---|---|---|---|---|---|---|---|---|---|
| Red Alder | 40 | 250.0 | 135.0 | 5492. | 15748. | | | | |
| TOTALS: | | 250.0 | 135.0 | 5492. | 15748. | | | | |

Stand Density Index: 248. Relative Density Index: 0.818

Quadratic Mean Diameter: 10.0 Height of 40 Largest: 95.5

Mean Diameter: 9.5 Mean Crown Ratio: 0.300

Sum % Largest Crown Areas: 77.2