Supplementary File

Contents

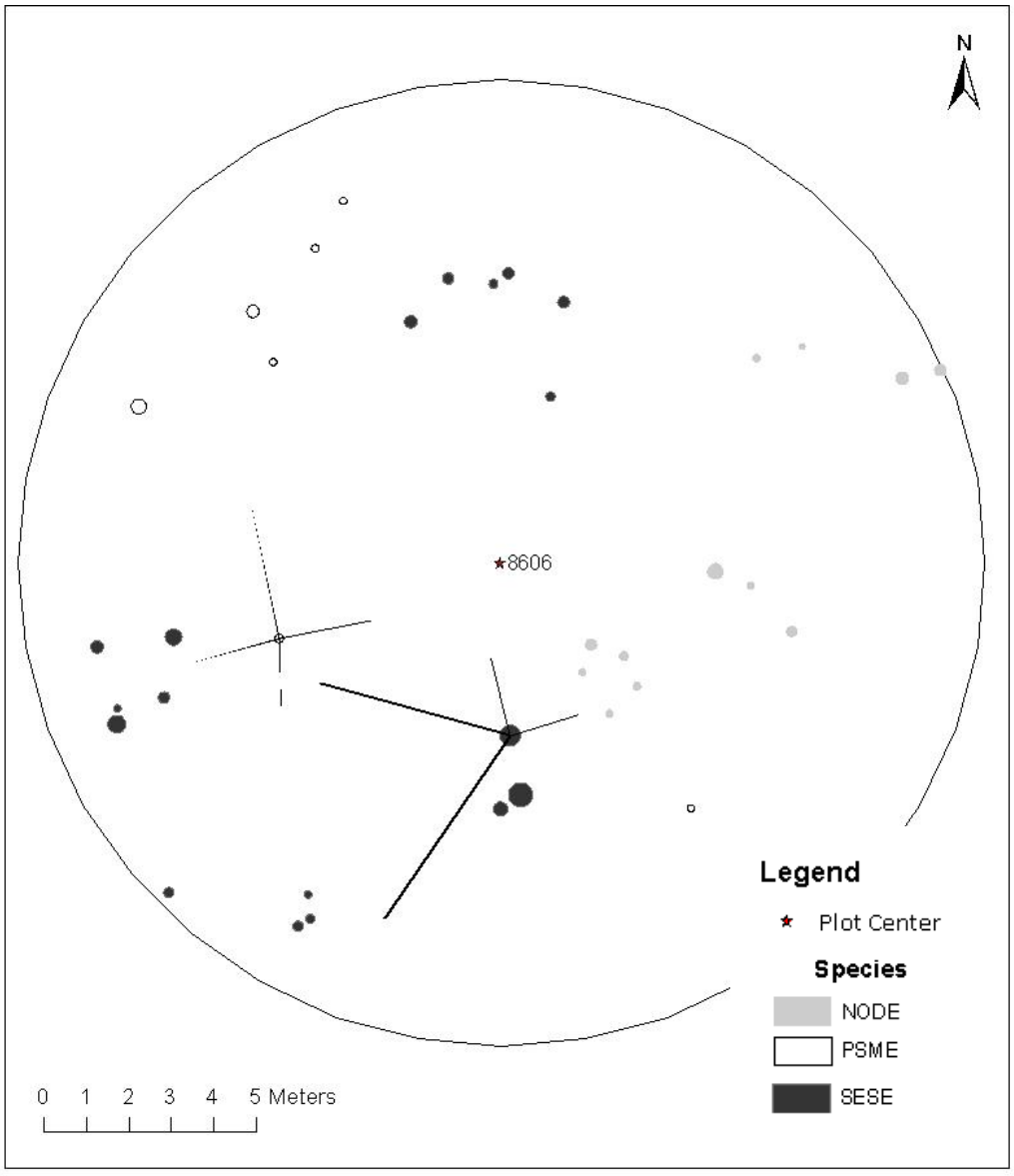

Figure S1. Depiction of Control plot number 8606 the large circle represents the 0.04 ha plot area. The small circles are the trees within the plot depicting their actual dbh and the lines are the sample tree branches the branch length and diameter is accurately depicted at Mendocino County, California.

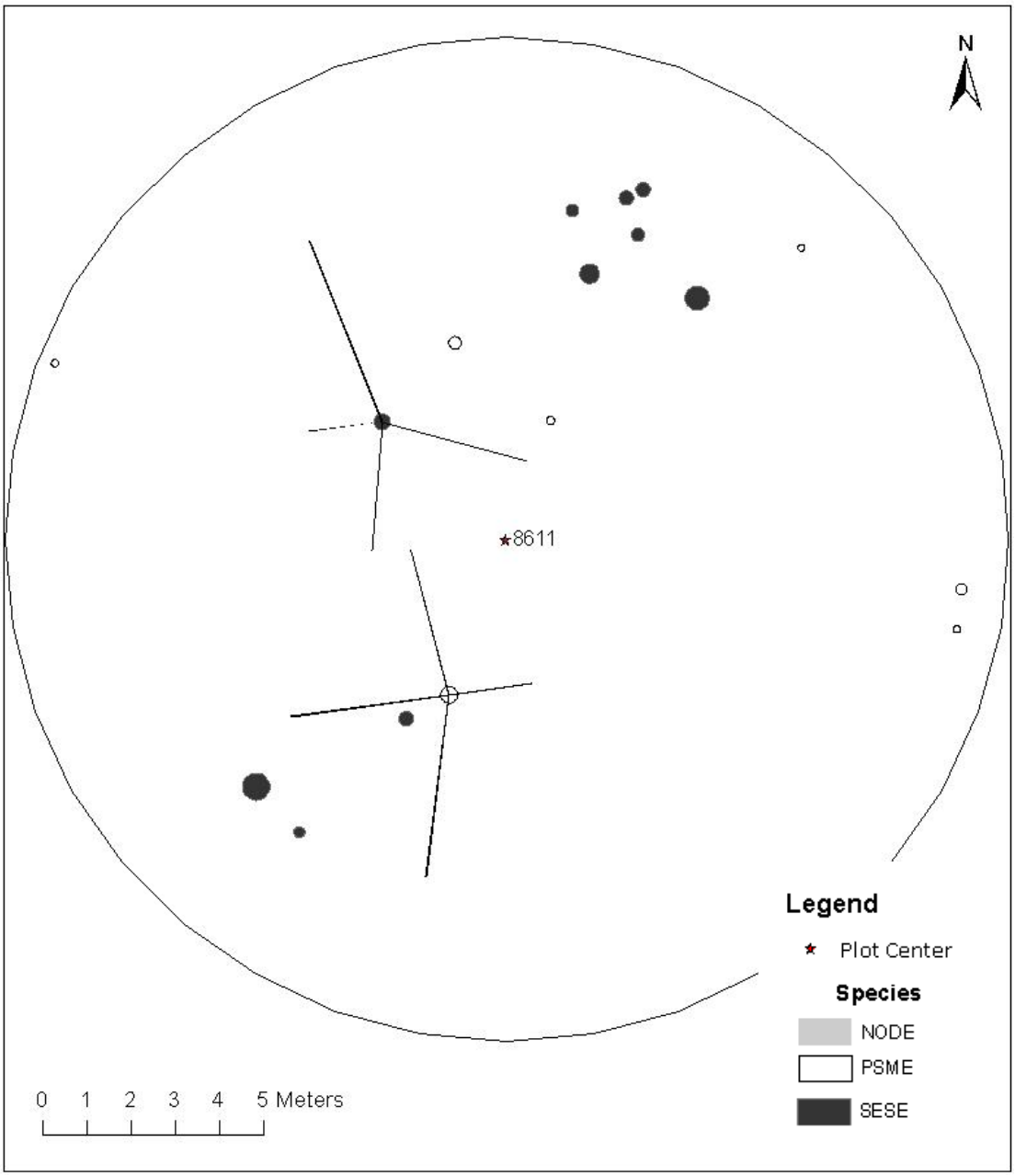

Figure S2. Depiction of Harvest plot number 8611 MRC California. The large circle represents the 0.04 ha plot area. The small circles are the trees within the plot depicting their actual dbh and the lines are the sample tree branches the branch length and diameter is accurately depicted at Mendocino County, California.

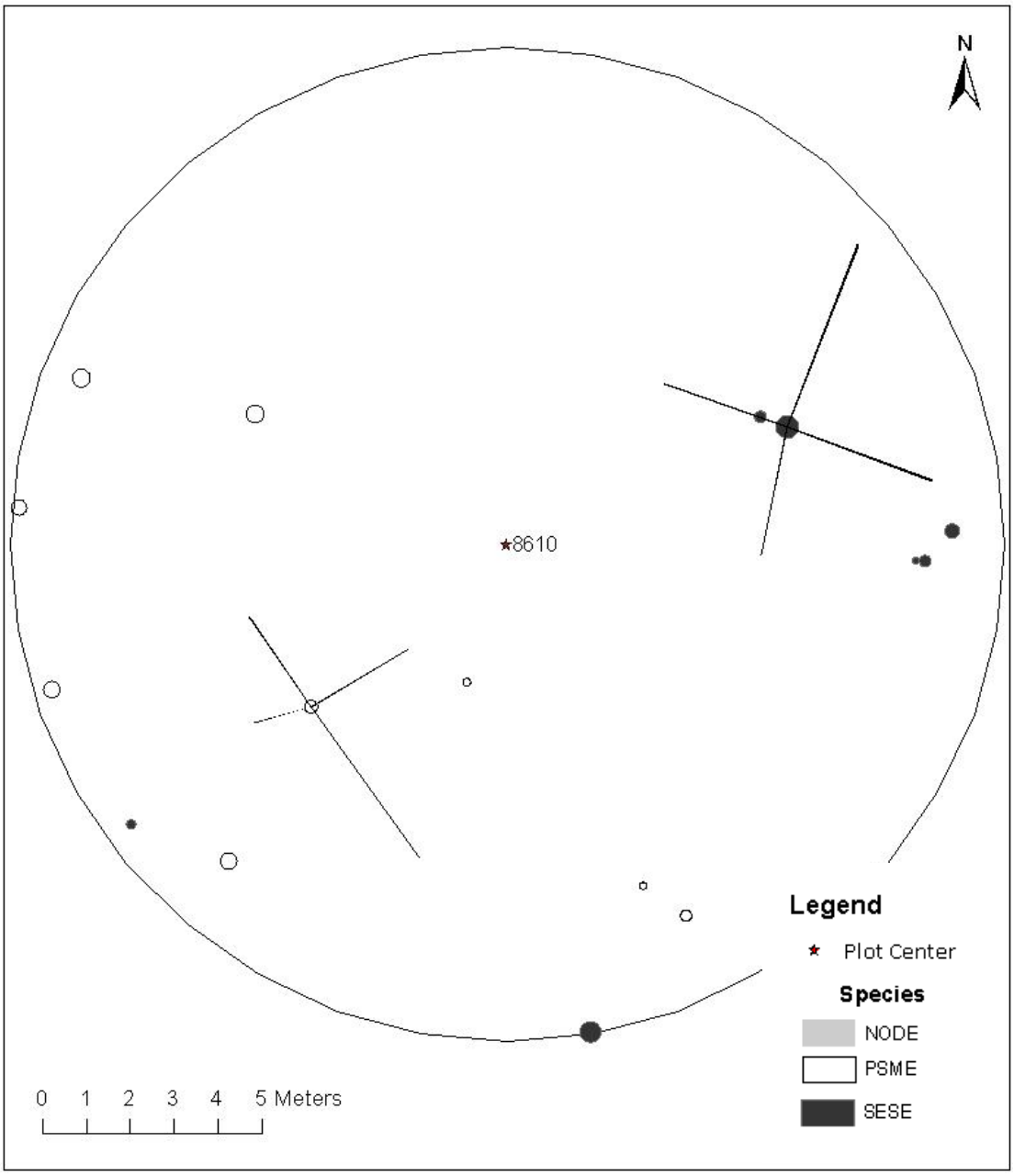

Figure S3. Depiction of Herbicide plot number 8610 MRC California. The large circle represents the 0.04 ha plot area. The small circles are the trees within the plot depicting their actual dbh and the lines are the sample tree branches the branch length and diameter is accurately depicted at Mendocino County, California.

Summary Data

Table S1. Summary table of target tree and branch level variables for control plots Mendocino County, California. BAL = Basal area of trees larger than target tree (m^2 ha^{-1}).

Variable	Mean	s.d.	Min	Max
DBH (cm)	48.9	22.7	18.5	93.5
Tree height (m)	28.4	7.7	16.4	46.7
Crown ratio	0.6	0.1	0.4	0.9
Neighbor dist. (m)	6.1	3.7	0.7	18.3
HDR	0.7	0.2	0.3	1.0
BAL (m^2 ha^{-1})*	22.3	19.6	0.0	65.7
Branch length (m)	3.1	1.8	0.1	8.0
MaxB (cm)	3.7	1.1	1.8	6.0
BIX (cm)	3.0	1.0	1.4	5.7
DBH.p	1.5	0.6	0.8	3.0
HT.p	1.4	0.2	0.9	1.9

Table S2. Summary table of target tree and branch level variables for Herbicide and Harvest treatment plots Mendocino County, California.

Variable	Mean		s.d.		Min		Max	
Plot type	**Herb.**	**Harvest**	**Herb.**	**Harvest**	**Herb.**	**Harvest**	**Herb.**	**Harvest**
DBH (cm)	46.9	45.8	24.2	17.1	18.0	18.3	109.5	85.6
Tree height (m)	26.5	27.7	7.3	8.9	14.8	15.5	43.1	53.0
Crown ratio	69%	70%	12%	14%	46%	43%	92%	94%
Neighbor dist. (m)	7.9	9.9	5.3	5.3	0.7	1.8	18.3	18.3
HDR	0.6	0.6	0.2	0.2	0.3	0.4	1.0	1.0
BAL (m^2 ha^{-1})*	23.1	22.9	18.2	16.4	0.0	0.0	61.2	63.4
Branch length (m)	3.2	2.9	1.8	1.6	0.3	0.2	7.7	6.6
MaxB (cm)	3.9	3.2	1.8	1.2	1.3	1.7	8.2	5.8
BIX (cm)	2.6	3.2	0.9	1.4	0.3	1.3	4.3	6.2
BGR	-0.41	1.40	0.49	3.48	-0.93	-0.94	1.61	14.81
DBH.p	1.3	1.3	0.5	0.4	0.6	0.6	2.9	2.4
HT.p	1.2	1.2	0.2	0.2	0.9	0.8	1.9	1.9

*BAL = Basal area of trees larger than target tree (m^2 ha^{-1})

Table S3. Stand level summary of variables for control plot type Mendocino County, California. Flow accumulation = 1k ten meter cells contributing water to plot.

Variable	Mean	s.d.	Min	Max
SDI (metric)	978	300	394	1408
BA (m^2 ha^{-1})	59	21	21	91
Tpha (trees ha^{-1})	247	79	110	380
%BA-NODE (%)*	29	12	12	49
%SDI-NODE (%)*	30	11	15	49
DBH (cm)	31.2	15.5	15.2	93.5
Tree height (m)	20.4	7.0	3.8	46.7
Crown ratio (%)	56.0	14.0	5.0	94.0
Flow accumulation	137.9	495.7	0.0	1928.0
Slope (%)	14.4	10.1	1.5	39.0
Aspect (0-360 °)	109.1	102.3	8.5	350.1
Coast distance (km)	26.7	8.2	14	40.7
BAI Index	1.0	0.5	0.2	1.9

*%BA-NODE or %SDI-NODE = proportion of plot BA or SDI comprised of tanoak.

Table S4. Stand level summary of variables for Herbicide and Harvest treatment plot types Mendocino County, California. Flow accumulation = 1k ten meter cells contributing water to plot.

Variable	Mean		s.d.		Min		Max	
Plot type	**Herb.**	**Harvest**	**Herb.**	**Harvest**	**Herb.**	**Harvest**	**Herb.**	**Harvest**
SDI (metric)	784.1	791.4	259.5	314.8	135.6	286.2	1237.5	1427.0
BA (m^2 ha^{-1})	48.9	49	18.3	20.8	6.3	18.1	76.1	83.1
Tpha (trees ha^{-1})	190.0	173.3	105.4	75.8	70.0	70.0	500.0	360.0
SDIm.r	238.9	528.9	93.2	194.8	83.2	196.9	374.5	801.0
BA.r (m^2 ha^{-1})	11.9	32.7	5.2	13.9	4.2	9.6	21.7	57.0
DBH (cm)	34.4	34.5	16.8	15.6	15.2	15.2	109.5	119.4
Tree height (m)	21.5	21.9	7.1	7.5	7.1	8.5	43.8	53.0
Crown ratio (%)	66	69	14	15	25	27	97	100.0
Flow accumulation	3.5	2.6	7.7	4.1	0.2	0.3	30.1	1.3
Slope (%)	16.3	15.6	6.9	7.3	5.3	3.7	45	31.6
Aspect (0-360°)	119.6	158.0	88.0	115.2	3.6	3.4	241.6	359.5
BAI Index	0.8	0.9	0.3	0.5	0.3	0.2	1.4	1.9

Regression Output

Table S5: BIX Informative Model (AIC) for redwood (SESE) and Douglas-fir (PSME; latent dummy variable) Mendocino County, California.

```
lm(formula = ∛(BD.M) ~ TreeDBH + I(TreeDBH^2) + species +
    BA + HT.p + cost.d + species:cost.d)

Residuals:
     Min       1Q   Median       3Q      Max
-0.13896 -0.04636  0.02342  0.04752  0.15998

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)         1.140e+00  2.813e-01   4.051  0.00083 ***
TreeDBH             2.008e-02  7.514e-03   2.672  0.01608 *
I(TreeDBH^2)       -1.682e-04  6.917e-05  -2.432  0.02637 *
speciesSESE         3.370e-01  1.617e-01   2.085  0.05250 .
Baha               -1.059e-03  1.866e-03  -0.568  0.57761
HT.p               -2.236e-01  1.324e-01  -1.688  0.10963
cost.d              2.141e-03  5.506e-03   0.389  0.70215
speciesSESE:cost.d -7.794e-03  5.607e-03  -1.390  0.18243
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.09312 on 17 degrees of freedom
Multiple R-squared:  0.6836,    Adjusted R-squared:  0.5534
F-statistic: 5.248 on 7 and 17 DF,  p-value: 0.002481 AIC= -39.389
```

Table S6. BIX DBH & Height Inventory Model (AIC) Mendocino County, California.

```
lm(formula = ∛(BD.M) ~ TreeDBH + I(TreeDBH^2) + BA + HT.p +
    species)

Residuals:
     Min       1Q   Median       3Q      Max
-0.16995 -0.04500  0.02329  0.05270  0.17151

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.189e+00  1.527e-01   7.783 2.52e-07 ***
TreeDBH       1.747e-02  6.807e-03   2.566   0.0189 *
I(TreeDBH^2) -1.366e-04  6.124e-05  -2.231   0.0380 *
speciesSESE   1.185e-01  4.705e-02   2.518   0.0209 *
BA           -4.624e-04  1.165e-03  -0.397   0.6959
HT.p         -2.099e-01  1.273e-01  -1.649   0.1157
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.09382 on 19 degrees of freedom
Multiple R-squared: 0.6411,     Adjusted R-squared: 0.5466
F-statistic: 6.787 on 5 and 19 DF, p-value: 0.00087 AIC= -40.23117
```

Table S7. BIX DBH Inventory Model (AIC) Mendocino County, California.

lm(formula = $\sqrt[3]{BD.M}$ ~ TreeDBH + I(TreeDBH^2) + species + BAL)

```
Residuals:
     Min       1Q   Median       3Q      Max
-0.20572 -0.06413  0.03139  0.05670  0.16609

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.122e+00  1.555e-01   7.217 5.51e-07 ***
TreeDBH       9.880e-03  5.784e-03   1.708   0.1031
I(TreeDBH^2) -8.368e-05  5.477e-05  -1.528   0.1422
speciesSESE   1.273e-01  5.232e-02   2.433   0.0245 *
BAL          -1.271e-03  1.561e-03  -0.814   0.4253
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.09648 on 20 degrees of freedom
Multiple R-squared: 0.6005,     Adjusted R-squared: 0.5206
F-statistic: 7.515 on 4 and 20 DF,  p-value:0.00073 AIC=-39.553
```

Table S8. AICc-derived Model for BIX including DBH and Height at Mendocino County, California.

lm(formula = $\sqrt[3]{BD.M}$ ~ TreeDBH + I(TreeDBH^2) + species +HDR)

```
Residuals:
      Min        1Q    Median        3Q       Max
-0.144802 -0.054179  0.005024  0.050321  0.157015

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.731e+00  2.756e-01   6.279 3.94e-06 ***
TreeDBH       5.911e-03  5.255e-03   1.125   0.2740
I(TreeDBH^2) -8.055e-05  4.747e-05  -1.697   0.1052
speciesSESE   6.009e-02  5.067e-02   1.186   0.2495
HDR          -6.285e-01  2.329e-01  -2.699   0.0138 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.08396 on 20 degrees of freedom
Multiple R-squared: 0.6974,     Adjusted R-squared: 0.6369
F-statistic: 11.52 on 4 and 20 DF,  p-value: 5.129e-05, AIC = -46.5
```

Table S9. MaxB Informative Model (AIC) Mendocino County, California.

```
lm(formula = ∛(BD.M) ~ TreeDBH + I(TreeDBH^2) + species +
    BA + condition + HT.p + coast.d + species:coast.d)

Residuals:
     Min       1Q   Median       3Q      Max
-0.13159 -0.06862 -0.01735  0.06173  0.13420

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)         1.1310734  0.3060436   3.696  0.00196 **
TreeDBH             0.0251607  0.0082819   3.038  0.00783 **
I(TreeDBH^2)       -0.0002126  0.0000740  -2.873  0.01104 *
speciesSESE         0.3547899  0.1701136   2.086  0.05339 .
Baha               -0.0002868  0.0021244  -0.135  0.89428
conditionD         -0.0909418  0.0627284  -1.450  0.16644
HT.p               -0.2089358  0.1394321  -1.498  0.15348
cost.d              0.0015762  0.0058461   0.270  0.79090
speciesSESE:cost.d -0.0084399  0.0058552  -1.441  0.16875
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.09724 on 16 degrees of freedom
Multiple R-squared:  0.7197,    Adjusted R-squared:  0.5795
F-statistic: 5.134 on 8 and 16 DF,  p-value: 0.002675 AIC=-36.741
```

Table S10. MaxB DBH & Height Inventory Model (AIC) Mendocino County, California.

```
lm(formula = ∛(BD.M) ~ TreeDBH + I(TreeDBH^2) + species +
                          BA + HT.p)

Residuals:
     Min       1Q   Median       3Q      Max
-0.16865 -0.06488  0.00899  0.07691  0.16079

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.202e+00  1.684e-01   7.133 8.81e-07 ***
TreeDBH       1.946e-02  7.508e-03   2.592   0.0179 *
I(TreeDBH^2) -1.627e-04  6.755e-05  -2.409   0.0263 *
speciesSESE   1.427e-01  5.190e-02   2.749   0.0128 *
BA           -8.687e-05  1.285e-03  -0.068   0.9468
HT.p         -1.853e-01  1.404e-01  -1.319   0.2028
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1035 on 19 degrees of freedom
Multiple R-squared: 0.6229,     Adjusted R-squared: 0.5237
F-statistic: 6.277 on 5 and 19 DF, p-value: 0.00134 AIC= -35.329
```

Table S11. MRC MaxB DBH Inventory Model (AIC) Mendocino County, California.

lm(formula = $\sqrt[3]{BD.M}$ ~ TreeDBH + I(TreeDBH^2) + species + BAL)

```
Residuals:
      Min        1Q    Median        3Q       Max
-0.191997 -0.055448  0.007382  0.095041  0.149554

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.160e+00  1.679e-01   6.907 1.04e-06 ***
TreeDBH       1.277e-02  6.246e-03   2.044   0.0543 .
I(TreeDBH^2) -1.144e-04  5.915e-05  -1.934   0.0674 .
speciesSESE   1.468e-01  5.650e-02   2.598   0.0172 *
BAL          -1.152e-03  1.686e-03  -0.683   0.5022
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1042 on 20 degrees of freedom
Multiple R-squared: 0.5977,     Adjusted R-squared: 0.5173
F-statistic:  7.43 on 4 and 20 DF,  p-value: 0.00077 AIC= -35.713
```

Table S12. AICc-derived model for MaxB at Mendocino County, California.

```
lm(formula = maxBD^(1/3) ~ TreeDBH + I(TreeDBH^2) + species)

Residuals:
      Min        1Q    Median        3Q       Max
-0.206559 -0.048705  0.006578  0.066327  0.182121

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.093e+00  1.343e-01   8.137 6.26e-08 ***
TreeDBH       1.364e-02  6.036e-03   2.259  0.03461 *
I(TreeDBH^2) -1.189e-04  5.803e-05  -2.049  0.05319 .
speciesSESE   1.682e-01  4.638e-02   3.627  0.00158 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1028 on 21 degrees of freedom
Multiple R-squared: 0.5884,     Adjusted R-squared: 0.5295
F-statistic:    10 on 3 and 21 DF,  p-value: 0.000268, AIC = -37.978
```

Table S13. MRC percent growth response Model (AIC) Mendocino County, California.

```
lm(formula = per.r ~ plot.type + period + sqrt(DBH) + SDIm.r +
 Species + SDIm + PH5A + plot.type:period + plot.type:SDIm.r)

Residuals:
    Min      1Q  Median      3Q     Max
-4.6305 -1.1798 -0.0692  0.5929  9.6786

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       -0.342616   2.517817  -0.136   0.8920
plot.typeX        -2.843742   1.595608  -1.782   0.0777 .
period            -0.367123   0.594390  -0.618   0.5382
sqrt(DBH)          0.616999   0.305017   2.023   0.0457 *
SDIm.r             0.001286   0.003367   0.382   0.7032
SpeciesSESE       -1.231714   0.542852  -2.269   0.0254 *
SDIm              -0.001516   0.001111  -1.365   0.1753
PH5A              -3.294426   0.807659  -4.079 8.99e-05 ***
plot.typeX:period -1.657980   0.798886  -2.075   0.0405 *
plot.typeX:SDIm.r  0.007201   0.003934   1.831   0.0701 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.101 on 102 degrees of freedom
Multiple R-squared: 0.4649,     Adjusted R-squared: 0.4177
F-statistic: 9.848 on 9 and 102 DF,  p-value: 9.887e-11
AIC= 495.720
```