**Supplementary file S2: Multivariate models**

**Partition of variation 1: Full model including both Scots pine and Norway spruce**

Table 1. The first four axes from the DCA.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | DCA 1 | DCA 2 | DCA 3 | DCA 4 |
| Eigenvalues | 0.25 | 0.22 | 0.18 | 0.19 |
| Axis lengths | 2.25 | 2.75 | 2.31 | 2.41 |

Table 2. Proportion of variation explained by constrained and unconstrained axes.

|  |  |  |
| --- | --- | --- |
|  | Inertia | Proportion |
| Constrained | 9.99 | 0.49 |
| Unconstrained | 10.22 | 0.50 |

Table 3. Eigenvalues for constrained and unconstrained axes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Constrained | RDA 1 | RDA 2 | RDA 3 | RDA 4 |
|  | 4.23 | 3.61 | 1.18 | 0.53 |
|  |  |  |  |  |
| Unconstrained | PC 1 | PC 2 | PC 3 | PC 4 |
|  | 2.77 | 1.63 | 1.34 | 0.96 |

Table 4. The different variables included in the model were tested in ANOVA with 999 permutations. The interaction between tree species and stand age is significant and was kept in the final model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Df | Variance | F | Pr(>F) |
| Tree species | 1 | 3.69 | 83.76 | < 0.001 |
| Age | 2 | 2.80 | 31.79 | < 0.001 |
| Level | 1 | 1.30 | 29.54 | < 0.001 |
| Aspect | 1 | 0.15 | 3.51 | 0.006 |
| Tree species × age | 2 | 2.04 | 23.20 | < 0.001 |

Table 5. The four first RDA axes, resulting from the model, were tested in ANOVA with 999 permutations.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Variance | F | Pr(>F) |
| RDA 1 | 4.23 | 95.92 | < 0.001 |
| RDA 2 | 3.61 | 82.01 | < 0.001 |
| RDA 3 | 1.18 | 26.78 | < 0.001 |
| RDA 4 | 0.53 | 11.95 | < 0.001 |

Diagram, venn diagram

Description automatically generated

Figure 1. Venn diagram illustrating the different shares of proportion of variation explained by the different variables included in the full model consisting of plots on both Scots pine and Norway spruce.

**Partition of variation 2: Reduced model including Scots pine**

Table 6. The first four axes from the DCA.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | DCA 1 | DCA 2 | DCA 3 | DCA 4 |
| Eigenvalues | 0.21 | 0.16 | 0.16 | 0.12 |
| Axis lengths | 2.11 | 2.55 | 2.13 | 1.86 |

Table 7. Proportion of variation explained by constrained and unconstrained axes.

|  |  |  |
| --- | --- | --- |
|  | Inertia | Proportion |
| Constrained | 11.37 | 0.52 |
| Unconstrained | 10.46 | 0.48 |

Table 8. Eigenvalues for constrained and unconstrained axes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Constrained | RDA 1 | RDA 2 | RDA 3 | RDA 4 |
|  | 8.43 | 2.02 | 0.70 | 0.23 |
|  |  |  |  |  |
| Unconstrained | PC 1 | PC 2 | PC 3 | PC 4 |
|  | 2.70 | 1.84 | 1.66 | 1.03 |

Table 9. The different variables included in the model were tested in ANOVA with 999 permutations.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Df | Variance | F | Pr(>F) |
| Age | 2 | 7.98 | 43.87 | < 0.001 |
| Level | 1 | 3.15 | 34.65 | < 0.001 |
| Aspect | 1 | 0.25 | 2.71 | 0.028 |

Table 10. The four first RDA axes, resulting from the model, were tested in ANOVA with 999 permutations.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Variance | F | Pr(>F) |
| RDA 1 | 8.43 | 92.68 | < 0.0001 |
| RDA 2 | 2.02 | 22.22 | < 0.0001 |
| RDA 3 | 0.70 | 7.64 | < 0.0001 |
| RDA 4 | 0.23 | 2.56 | 0.014 |

Diagram, venn diagram

Description automatically generated

Figure 2. Venn diagram illustrating the different shares of proportion of variation explained by the different variables included in the reduced model consisting of plots on Scots pine.

**Partition of variation 3: Reduced model including Norway spruce**

Table 11. The first four axes from the DCA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | DCA 1 | DCA 2 | DCA 3 | DCA 4 |
| Eigenvalues | 0.28 | 0.19 | 0.10 | 0.12 |
| Axis lengths | 2.45 | 1.68 | 1.37 | 1.44 |

Table 12. Proportion of variation explained by constrained and unconstrained axes.

|  |  |  |
| --- | --- | --- |
|  | Inertia | Proportion |
| Constrained | 3.11 | 0.27 |
| Unconstrained | 8.25 | 0.73 |

Table 13. Eigenvalues for constrained and unconstrained axes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | RDA 1 | RDA 2 | RDA 3 | RDA 4 |
| Constrained | 1.62 | 1.16 | 0.26 | 0.07 |
|  |  |  |  |  |
|  | PC 1 | PC 2 | PC 3 | PC 4 |
| Unconstrained | 2.23 | 1.57 | 0.94 | 0.76 |

Table 14. The different variables included in the model were tested in ANOVA with 999 permutations.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Df | Variance | F | Pr(>F) |
| Age | 2 | 1.76 | 12.24 | 0.001 |
| Level | 1 | 1.10 | 15.27 | 0.001 |
| Aspect | 1 | 0.26 | 3.60 | 0.002 |

Table 15. The four first RDA axes, resulting from the model, were tested in ANOVA with 999 permutations.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Variance | F | Pr(>F) |
| RDA 1 | 1.61 | 22.55 | < 0.001 |
| RDA 2 | 1.16 | 16.19 | < 0.001 |
| RDA 3 | 0.26 | 3.70 | 0.007 |
| RDA 4 | 0.07 | 0.92 | 0.479 |

Diagram, venn diagram

Description automatically generated

Figure 3. Venn diagram illustrating the different shares of proportion of variation explained by the different variables included in the reduced model consisting of plots on Norway spruce.