

1 **Appendix S6. Relationships between difference in beneficiary species cover**
 2 **between the undershrub and interspace microsites¹ and beneficiary species'**
 3 **plot-level cover (community composition)² and the NMS ordination axes.**

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| Focal species | <u>Pearson</u> | | <u>Relative importance of the axis 1 and 2</u> | | | |
|------------------------------------|--------------------------|-------|--|------------------------------|---------------|----------------|
| | <u>correlations with</u> | | <u>scores as predictors in an NPMR</u> | | | |
| | <u>NMS ordination</u> | | <u>Sensitivity to axis 1</u> | <u>Sensitivity to axis 2</u> | <u>xR2 **</u> | <u>p-value</u> |
| <u>Difference in cover between</u> | | | | | | |
| <u>under-shrub and interspace</u> | | | | | | |
| <u>microsites</u> | | | | | | |
| <i>Elymus elymoides</i> | 0.68 | 0.72 | 0.59 | 0.74 | 0.56 | 0.004 |
| <i>Poa secunda</i> | 0.41 | 0.65 | 0.44 | 0.76 | 0.41 | 0.004 |
| <i>Achnatherum. thurberianum</i> | 0.23 | 0.67 | 0.1 | 1.2 | 0.44 | 0.004 |
| <i>Pseudoroegneria spicata</i> | 0.58 | 0.4 | 0.52 | 0.94 | 0.33 | 0.004 |
| <i>Achnatherum hymenoides</i> | 0.07 | 0.11 | - | - | 0.02 | 0.56 |
| <i>Hespirostipa comata</i> | 0.19 | 0.08 | - | - | 0.04 | 0.31 |
| <i>Bromus tectorum</i> | 0.38 | -0.51 | 0.63 | 1.11 | 0.52 | 0.004 |
| <i>Lepidium perfoliatum</i> | 0.05 | -0.68 | 0.25 | 1.5 | 0.47 | 0.004 |
| <u>Plot-level cover (community</u> | | | | | | |
| <u>composition)</u> | | | | | | |
| <i>Elymus elymoides</i> | 0.2 | 0.24 | 0.07 | 1.16 | 0.46 | 0.004 |
| <i>Poa secunda</i> | -0.39 | -0.49 | 0.16 | 1.22 | 0.29 | 0.004 |
| <i>Achnatherum. thurberianum</i> | -0.41 | -0.33 | 0.81 | 0.64 | 0.2 | 0.004 |
| <i>Pseudoroegneria spicata</i> | -0.58 | -0.44 | 1.15 | 0.25 | 0.27 | 0.004 |
| <i>Achnatherum hymenoides</i> | 0.04 | 0.07 | - | - | 0.06 | 0.18 |
| <i>Hespirostipa comata</i> | 0.11 | 0.09 | - | - | 0.09 | 0.187 |
| <i>Bromus tectorum</i> | 0.47 | 0.45 | 0.3 | 1.48 | 0.3 | 0.004 |
| <i>Lepidium perfoliatum</i> | 0.21 | 0.43 | 0.09 | 1.59 | 0.19 | 0.004 |

* Variables moderately or strongly correlated with ordination axis are highlighted in grey

** Cross-validated coefficient of determination for NPMR model with both axis 1 & 2 ordination scores as predictors

¹ The "difference in cover" was used to quantify the spatial pattern of association between *Artemisia* and beneficiary species

² Plot-level cover (community composition) was used to estimate the location of a focal species relative to its ecological optimum, defined as the location of maximum composition in the community, along the gradients.

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