Additional file 9. Meta-regressions

2-7 Abundance of vegetation vs. duration of herbivory manipulation
8-13 Species richness of vegetation vs. duration of herbivory manipulation
14-19 Abundance of vegetation vs. herbivore density
20-25 Species richness of vegetation vs. herbivore density
26-31 Abundance of vegetation vs. herbivore biomass
32-37 Species richness of vegetation vs. herbivore biomass
38-43 Abundance of vegetation vs. herbivore years
44-49 Species richness of vegetation vs. herbivore years
50-55 Abundance of vegetation vs. herbivore biomass years
56-61 Species richness of vegetation vs. herbivore biomass years
62-67 Abundance of vegetation vs. mean annual temperature
68-73 Species richness of vegetation vs. mean annual temperature
74-79 Abundance of vegetation vs. mean annual precipitation
80-85 Species richness of vegetation vs. mean annual precipitation
86-91 Abundance of vegetation vs. latitude
92-97 Species richness of vegetation vs. latitude

Sizes of symbols are proportional to the inverse variance of the standardised mean difference.
Where a significant relationship was found (p < 0.05), a regression line is shown (with 95% confidence limits).
Understorey abundance vs. duration of herbivory manipulation

\[
\text{Standardised mean difference}
\]

\[
est = 0.022
\]

\[
\text{se} = 0.3936
\]

\[
P = 0.956
\]
Woody understorey abundance vs. duration of herbivory manipulation

Standardised mean difference

\[ \text{est} = -0.411 \]
\[ \text{se} = 0.2483 \]
\[ P = 0.098 \]
Tree sapling abundance vs. duration of herbivory manipulation

Standardised mean difference

est = −0.717
se = 0.6512
P = 0.271
Shrub abundance vs. duration of herbivory manipulation

\[
\text{est} = -0.398 \\
\text{se} = 0.4039 \\
P = 0.324
\]
Graminoid abundance vs. duration of herbivory manipulation

est = 0.132
se = 0.4035
P = 0.744
Forb abundance vs. duration of herbivory manipulation

est = 0.749
se = 0.3319
P = 0.024
Understorey species richness vs. duration of herbivory manipulation

\[ \text{est} = 0.918 \]
\[ \text{se} = 0.5225 \]
\[ P = 0.079 \]
Woody understorey species richness vs. duration of herbivory manipulation

est = -2.337
se = 0.8512
P = 0.006
Tree sapling species richness vs. duration of herbivory manipulation

est = -3.285
se = 1.3157
P = 0.013
Shrub species richness vs. duration of herbivory manipulation

\[ \text{est} = -5.043 \]
\[ \text{se} = 33.2168 \]
\[ P = 0.879 \]
Graminoid species richness vs. duration of herbivory manipulation

est = 3.376
se = 2.2896
P = 0.14
Forb species richness vs. duration of herbivory manipulation

est = 1.589
se = 1.0109
P = 0.116
Understorey abundance vs. herbivore density (all ungulates)

est = -0.825
se = 0.3358
P = 0.014
Woody understorey abundance vs. herbivore density (all ungulates)

\[ \text{log [no. of animals (/km²)]} \]

\[
\text{Standardised mean difference} = -0.428 \\
\text{se} = 0.1787 \\
P = 0.017
\]
Tree sapling abundance vs. herbivore density (all ungulates)

Standardised mean difference

$est = -0.393$

$se = 0.397$

$P = 0.322$
Shrub abundance vs. herbivore density (all ungulates)

Standardised mean difference

est = -0.459
se = 0.2464
P = 0.063
Grassland vegetation abundance vs. herbivore density (all ungulates)

\[
\text{log [no. of animals (/km²)]}
\]

\[
\text{Standardised mean difference}
\]

\[
est = 0.548 \quad \text{se} = 0.3544 \quad P = 0.122
\]
Forb abundance vs. herbivore density (all ungulates)

$\text{est} = 0.02, \text{se} = 0.2203, P = 0.929$
Understorey species richness vs. herbivore density (all ungulates)

Standardised mean difference

$\text{est} = -0.446$

$\text{se} = 0.3116$

$P = 0.152$
Woody understorey species richness vs. herbivore density (all ungulates)

\[
\text{Standardised mean difference} = -0.306
\]
\[
\text{se} = 0.4041
\]
\[
P = 0.448
\]
Tree sapling species richness vs. herbivore density (all ungulates)

Standardised mean difference

est = −0.796
se = 0.63
P = 0.206
Shrub species richness vs. herbivore density (all ungulates)

- est = 0.18
- se = 1.0057
- P = 0.858
Graminoid richness vs. herbivore density (all ungulates)

est = 0.61
se = 1.1651
P = 0.601
Forb species richness vs. herbivore density (all ungulates)

- est = 0.268
- se = 0.5617
- P = 0.634
Understorey abundance vs. herbivore biomass

Standardised mean difference

est = -0.639
se = 0.3756
P = 0.089
Woody understorey abundance vs. herbivore biomass

Standardised mean difference

est = -0.438
se = 0.1928
P = 0.023

log [metabolic biomass (kg/km²)]
Tree sapling abundance vs. herbivore biomass

\[ \text{log [metabolic biomass (kg/km2)]} \]

\[ \text{Standardised mean difference} \]

\[ \text{est} = 0.18 \]
\[ \text{se} = 0.4912 \]
\[ P = 0.714 \]
Shrub abundance vs. herbivore biomass

Estimated mean difference: $\text{est} = -0.309$

Standard error: $\text{se} = 0.2289$

$p$-value: $P = 0.176$
Graminoid abundance vs. herbivore biomass

Standardised mean difference

est = 0.59
se = 0.4009
P = 0.141
Forb abundance vs. herbivore biomass

standardised mean difference

$est = 0.304$

$se = 0.2031$

$P = 0.135$
Understorey species richness vs. herbivore biomass

Standardised mean difference

est = 0.061

se = 0.2977

P = 0.839

log [metabolic biomass (kg/km²)]
Woody understorey species richness vs. herbivore biomass

Standardised mean difference

$\text{est} = -0.005$

$\text{se} = 0.4735$

$P = 0.991$
Tree sapling species richness vs. herbivore biomass

\[ \text{log } \left( \text{metabolic biomass (kg/km²)} \right) \]

- \( \text{est} = -0.132 \)
- \( \text{se} = 0.5917 \)
- \( P = 0.824 \)
Shrub species richness vs. herbivore biomass

Standardised mean difference

\[ \text{est} = 0.03 \]
\[ \text{se} = 0.7337 \]
\[ P = 0.967 \]
Graminoid species richness vs. herbivore biomass

Estimate (est) = 0.708
Standard error (se) = 0.8726
P-value (P) = 0.417
Forb species richness vs. herbivore biomass

est = 0.371  
se = 0.4689  
P = 0.429
Understorey abundance vs. herbivore years

Standardised mean difference

\[ \text{est} = -0.692 \]
\[ \text{se} = 0.2643 \]
\[ P = 0.009 \]
Woody understorey abundance vs. herbivore years

Standardised mean difference:

\[
\text{est} = -0.406 \\
\text{se} = 0.1596 \\
\text{P} = 0.011
\]
Tree sapling abundance vs. herbivore years

$\log_{10}[(\text{duration (years)} \times \text{no. of animals (/km}^2))]$

Standardised mean difference

est = -0.56
se = 0.3493
P = 0.109
Shrub abundance vs. herbivore years

\[ \text{Standardised mean difference} = -0.445 \]
\[ \text{se} = 0.2215 \]
\[ P = 0.045 \]
Grassland abundance vs. herbivore years

log (duration (years) \times \text{no. of animals (}/\text{km}^2))

\text{est} = 0.802
\text{se} = 0.385
\text{P} = 0.037
Forb abundance vs. herbivore years

\[ \log [(\text{duration (years)} \times \text{no. of animals (km}^2)] \]

- est = 0.208
- se = 0.1996
- P = 0.298
Understorey species richness vs. herbivore years

est = -0.156
se = 0.2675
P = 0.559
Woody understorey species richness vs. herbivore years

Standardised mean difference

est = -0.49
se = 0.373
P = 0.189
Tree sapling species richness vs. herbivore years

\[ \text{log } [(\text{duration (years)} \times \text{no. of animals } / \text{km}^2)] \]

Standardised mean difference

\[ \text{est} = -1.529 \]
\[ \text{se} = 0.4723 \]
\[ P = 0.001 \]
Shrub species richness vs. herbivore years

$\text{est} = 0.17$
$\text{se} = 0.9906$
$P = 0.864$

log [(duration (years) x no. of animals (/km2)])

Standardised mean difference
Graminoid species richness vs. herbivore years

\[ \log\left(\text{duration (years)} \times \text{no. of animals (/km2)}\right) \]

Estimated standardised mean difference: \( \text{est} = 0.61 \), \( \text{se} = 1.1651 \), \( P = 0.601 \)
Forb species richness vs. herbivore years

\[ \log[(\text{duration (years)} \times \text{no. of animals (/km}^2))] \]

\[ \text{est} = 2.195 \]
\[ \text{se} = 1.1093 \]
\[ P = 0.048 \]
Understorey abundance vs. herbivore biomass years

Standardised mean difference: est = -0.496, se = 0.2859, P = 0.083
Woody understorey abundance vs. herbivore biomass years

Standardised mean difference

\[ \text{est} = -0.359 \]

\[ \text{se} = 0.1619 \]

\[ P = 0.027 \]
Tree sapling abundance vs. herbivore biomass years

Standardised mean difference

est = -0.251
se = 0.4775
P = 0.599
Shrub abundance vs. herbivore biomass years

est = -0.298
se = 0.2004
P = 0.137
Graminoid abundance vs. herbivore biomass years

Standardised mean difference

est = 0.559
se = 0.3608
P = 0.121

log [duration (years) x metabolic biomass (kg/km²)]
Forb abundance vs. herbivore biomass years

Standardised mean difference

est = 0.316
se = 0.1611
P = 0.05

log [duration (years) x metabolic biomass (kg/km²)]
Understorey species richness vs. herbivore biomass years

Standardised mean difference

est = 0.132
se = 0.2272
P = 0.563

log [duration (years) x metabolic biomass (kg/km²)]
Woody understorey species richness vs. herbivore biomass years

est = -0.279
se = 0.4783
P = 0.56
Tree sapling species richness vs. herbivore biomass years

Standardised mean difference

est = -0.456
se = 0.6381
P = 0.475
Shrub species richness vs. herbivore biomass years

Standardised mean difference

$\text{est} = 0.027$
$\text{se} = 0.7304$
$P = 0.97$
Graminoid species richness vs. herbivore biomass years

Standardised mean difference

est = 0.708
se = 0.8726
P = 0.417

log [duration (years) x metabolic biomass (kg/km2)]
Forb species richness vs. herbivore biomass years

est = 0.614
se = 0.4838
P = 0.204
Understorey abundance vs. mean annual temperature

Standardised mean difference

est = -0.039
se = 0.0343
P = 0.259
Woody understorey abundance vs. mean annual temperature

est = -0.032
se = 0.02
P = 0.105
Standardised mean difference 
est = -0.034
se = 0.0737
P = 0.642

Tree sapling abundance vs. mean annual temperature
Shrub abundance vs. mean annual temperature

est = 0.003
se = 0.0214
P = 0.879
Graminoid abundance vs. mean annual temperature

\[ \text{est} = -0.066 \]
\[ \text{se} = 0.0372 \]
\[ P = 0.075 \]
Forb abundance vs. mean annual temperature

\[ est = -0.036 \]
\[ se = 0.0195 \]
\[ P = 0.063 \]
Understorey species richness vs. mean annual temperature

est = −0.142
se = 0.0489
P = 0.004
Woody understorey species richness vs. mean annual temperature

\[ \text{Standardised mean difference} = -0.218, \quad \text{se} = 0.0898, \quad P = 0.015 \]
Tree sapling species richness vs. mean annual temperature

Standardised mean difference: $est = -0.333$, $se = 0.1099$, $P = 0.002$
Shrub species richness vs. mean annual temperature

est = 0.005
se = 0.4498
P = 0.992
Graminoid species richness vs. mean annual temperature

est = 0.173
se = 0.3548
P = 0.625
Forb species richness vs. mean annual temperature

est = -0.135
se = 0.2078
P = 0.515
Understorey abundance vs. mean annual precipitation

Standardised mean difference

est = -0.297
se = 0.7351
P = 0.686
Woody understorey abundance vs. mean annual precipitation

Standardised mean difference

est = −0.131
se = 0.4114
P = 0.751

log [precipitation (mm)]
Tree sapling abundance vs. mean annual precipitation

est = -0.509
se = 0.8334
P = 0.542
Shrub abundance vs. mean annual precipitation

$\text{est} = -0.856$
$\text{se} = 0.4356$
$P = 0.049$
Graminoid abundance vs. mean annual precipitation

$\text{est} = -0.079$

$\text{se} = 0.9185$

$P = 0.931$
Forb abundance vs. mean annual precipitation

\[
\begin{align*}
\text{est} &= -0.698 \\
\text{se} &= 0.4721 \\
\text{P} &= 0.139
\end{align*}
\]
Understorey species richness vs. mean annual precipitation

\[ \text{est} = -3.902 \]
\[ \text{se} = 0.9293 \]
\[ P = 0 \]
Woody understorey species richness vs. mean annual precipitation

Standardised mean difference

est = -1.208
se = 1.0288
P = 0.24
Tree sapling species richness vs. mean annual precipitation

standardised mean difference

est = -2.602
se = 1.2605
P = 0.039
Shrub species richness vs. mean annual precipitation

est = 0.039
se = 2.5159
P = 0.988
Graminoid species richness vs. mean annual precipitation

Standardised mean difference

est = 2.363
se = 7.5954
P = 0.756
Forb species richness vs. mean annual precipitation

est = -2.543
se = 2.9169
P = 0.383
Understorey abundance vs. latitude

Standardised mean difference

est = 0.016
se = 0.0151
P = 0.299
Woody understorey abundance vs. latitude

Standardised mean difference

est = 0.01
se = 0.0087
P = 0.269
Tree sapling abundance vs. latitude

est = -0.04
se = 0.0215
P = 0.063
Shrub abundance vs. latitude

est = -0.006
se = 0.0094
P = 0.52
Graminoid abundance vs. latitude

est = 0.017
se = 0.0155
P = 0.283
Forb abundance vs. latitude

est = 0.019
se = 0.0076
P = 0.013
Understorey species richness vs. latitude

est = 0.059
se = 0.0144
P = 0
Woody understorey species richness vs. latitude

\[ \text{est} = 0.023 \]
\[ \text{se} = 0.0345 \]
\[ P = 0.509 \]
Tree sapling species richness vs. latitude

est = 0.059
se = 0.0688
P = 0.393
Shrub species richness vs. latitude

est = 0
se = 0.1203
P = 0.998
Graminoid species richness vs. latitude

est = 0.06
se = 0.0388
P = 0.125
Forb species richness vs. latitude

est = 0.098
se = 0.029
P = 0.001