Interaktívne vplyvy stromovej kompetície, škodcov, klímy a manažmentu na pokalmitný vývoj lesa (INTERA)

Bohdan Konôpka, Vladimír Šebeň, Jozef Pajtík, František Máliš a kol.

Vplyvy prostredia a manažmentu na produkciu, resp. biodiverzitu (Vysoké Tatry, MP):

- Konôpka, B., Šebeň, V., Pajtík, J., 2019: Species Composition and Carbon Stock of Tree Cover at a Postdisturbance Area in Tatra National Park, Western Carpathians. Mountain Research and Development, 39:R71–R80.
- Konôpka, B., Šebeň, V., Merganičová, K., 2021: Forest regeneration patterns differ considerably between sites with and without windthrow wood logging in the High Tatra Mountains. Forests, 12:1349.

Medzi- a vnútro-druhová kompetícia (Vysoké Tatry, tranzekty):

- Konôpka, B., Pajtík, J., Šebeň, V., Merganičová, K., Surový, P., 2020: Silver birch aboveground biomass allocation pattern, stem and foliage traits with regard to intraspecific crown competition. Central European Forestry Journal, 66:159–169.
- Máliš, F., Konôpka, B., Šebeň, V., Pajtík, J., Merganičová, K., 2021: Short-term dynamics of vegetation diversity and aboveground biomass of *Picea abies* (L.) H. Karst. forests after heavy windstorm disturbance. Forests, 12: 97.

Vplyv prežúvavej raticovej zveri na lesné dreviny (DO Husárik):

- Konôpka, B., Šebeň, V., Pajtík, J., Shipley, L.A., 2021: Excluding large wild herbivores reduced Norway spruce dominance and supported tree species richness in a young, naturally regenerated stand. Forests12: 737.
- Konôpka, B., Šebeň, V., Pajtík, J., Shipley, L.A., 2022: Influence of Tree Species and Size on Bark Browsing by Large Wild Herbivores. Plants 11: 2925.

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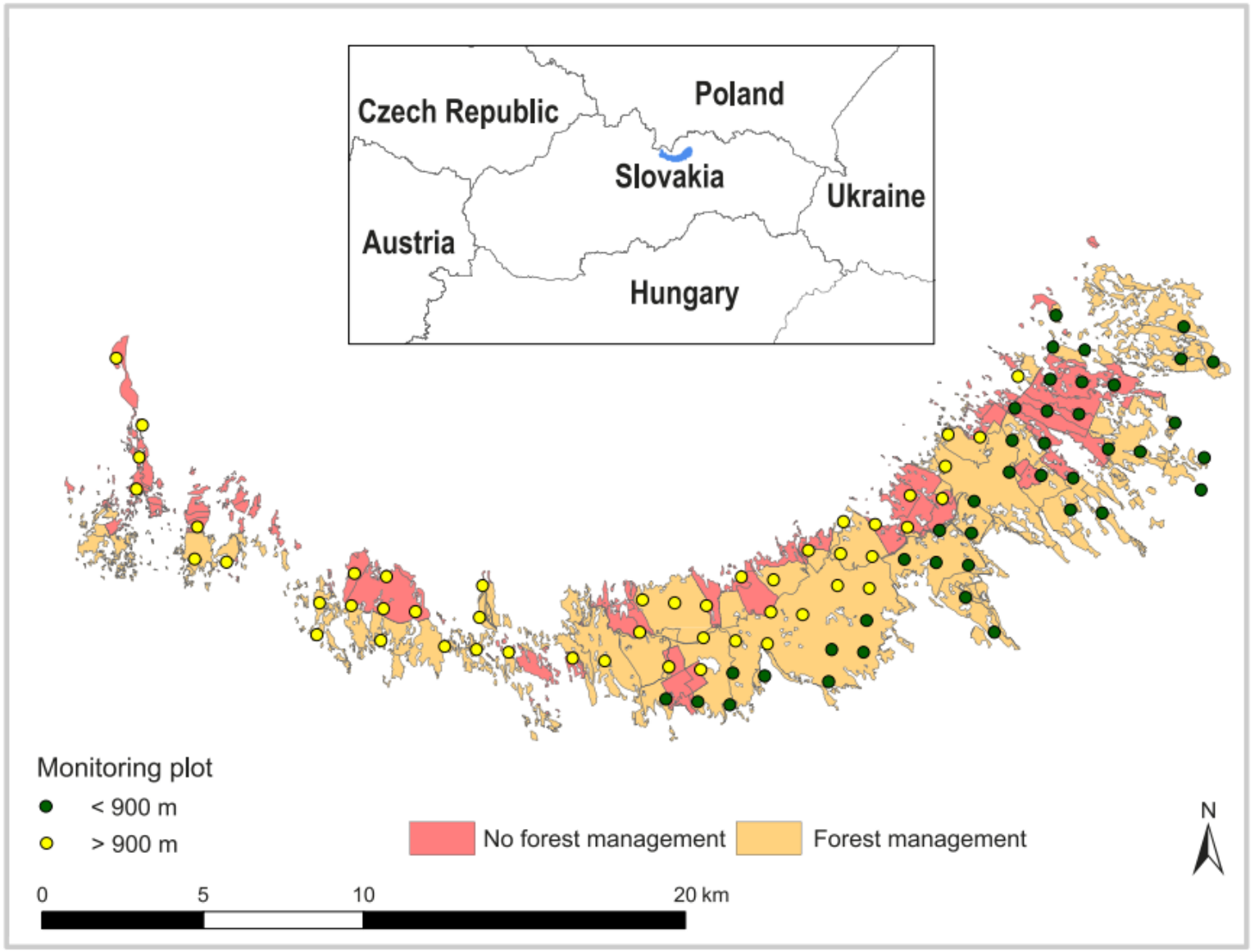
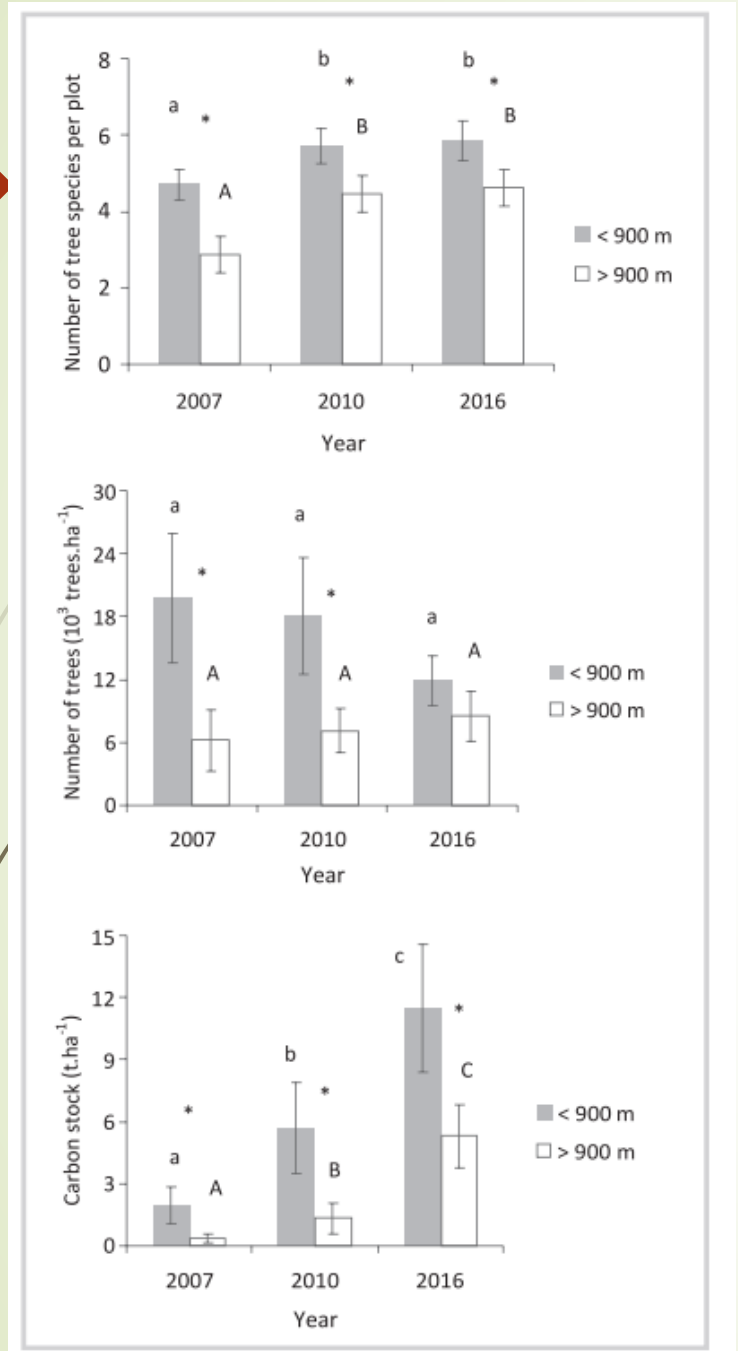
MountainResearch
Systems knowledge

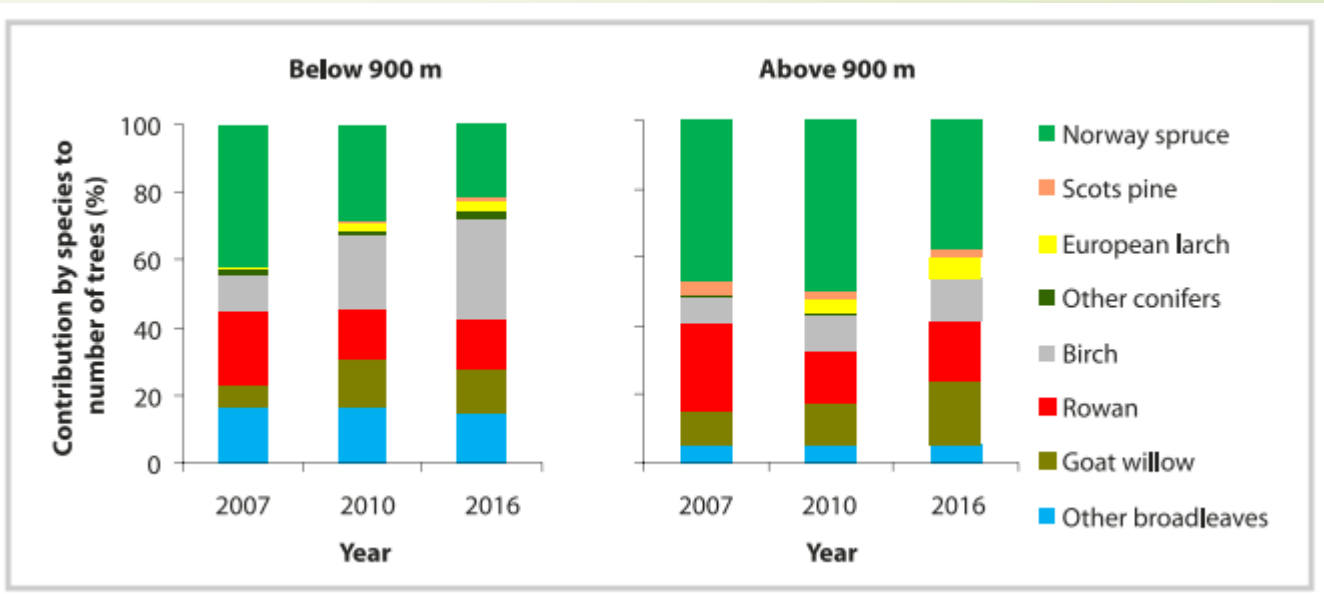
Species Composition and Carbon Stock of Tree Cover at a Postdisturbance Area in Tatra National Park, Western Carpathians

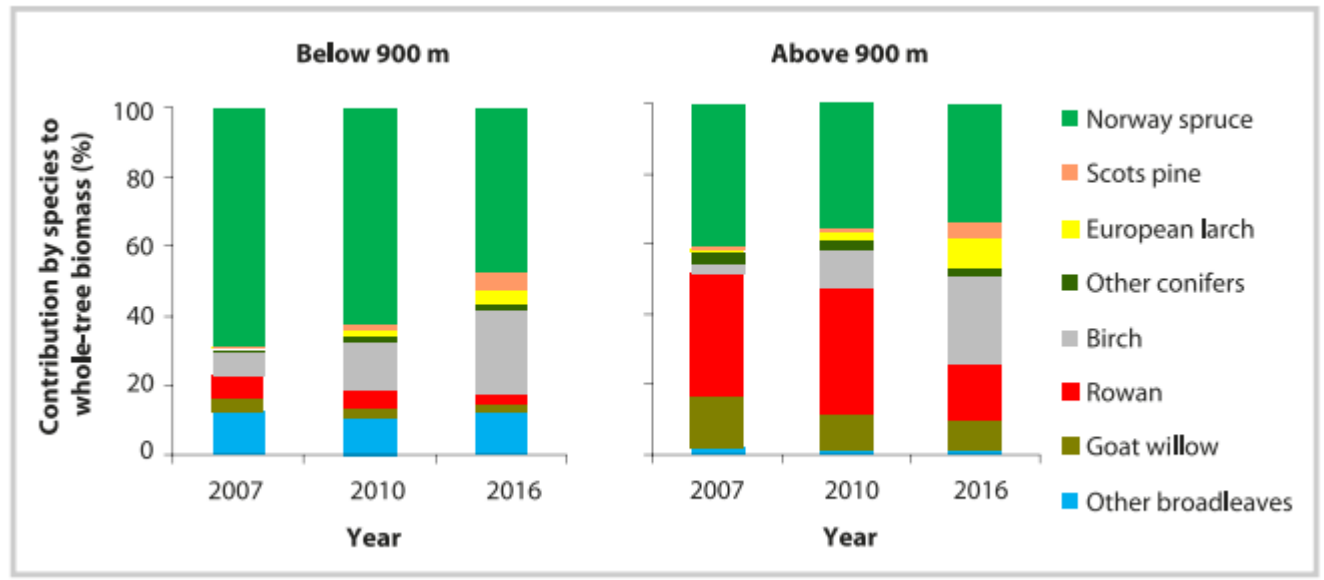
Bohdan Konôpka[1,2], Vladimír Šebeň[1], and Jozef Pajtík[1]*

FIGURE 1 Location of the windthrow belt in Central Europe, and core of the windthrow area in the Tatra National Park, showing the monitoring plots in 2 zones (foothill, $n = 41$, and mountain, $n = 49$), and high-level and low-level nature conservation areas. (Map by Vladimír Šebeň)




Number of tree species per plot
Year
2007
2010
2016
< 900 m
> 900 m
Number of trees (10^3 trees.ha^{-1})
Carbon stock (t.ha^{-1})


Below 900 m
Above 900 m
Contribution by species to number of trees (%)
Year
Norway spruce
Scots pine
European larch
Other conifers
Birch
Rowan
Goat willow
Other broadleaves


Below 900 m
Above 900 m
Contribution by species to whole-tree biomass (%)
Year
Norway spruce
Scots pine
European larch
Other conifers
Birch
Rowan
Goat willow
Other broadleaves

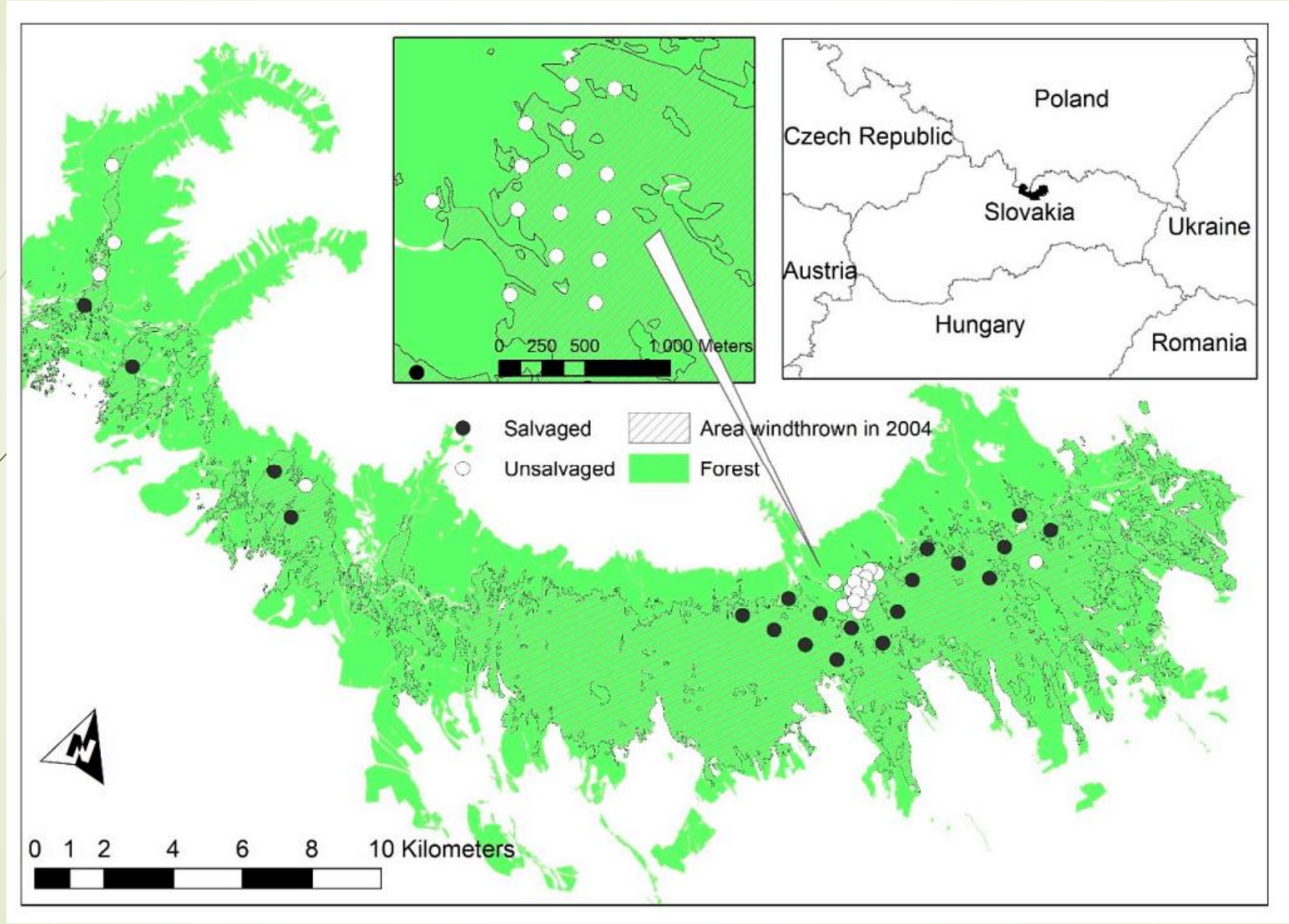
forests

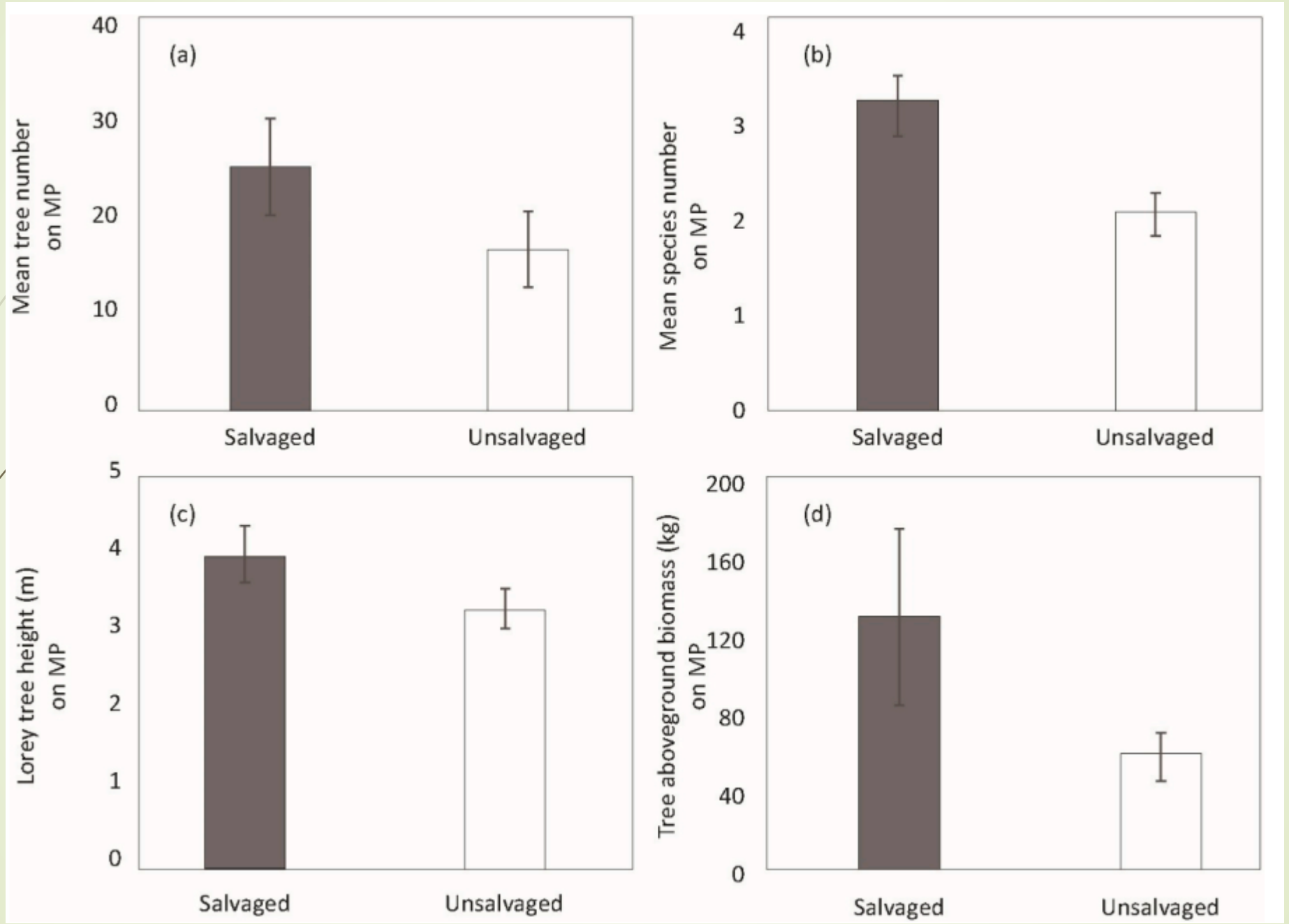
MDPI

Article

Forest Regeneration Patterns Differ Considerably between Sites with and without Windthrow Wood Logging in the High Tatra Mountains

Bohdan Konôpka [1,2], Vladimír Šebeň [1,*] and Katarína Merganičová [2,3]


Poland
Czech Republic
Slovakia
Ukraine
Austria
Hungary
Romania
0 250 500 1,000 Meters
Salvaged
Unsalvaged
Area windthrown in 2004
Forest
0 1 2 4 6 8 10 Kilometers


(a)
Mean tree number on MP
40
30
20
10
0
Salvaged
Unsalvaged
(b)
Mean species number on MP
4
3
2
1
0
Salvaged
Unsalvaged
(c)
Lorey tree height (m) on MP
5
4
3
2
1
0
Salvaged
Unsalvaged
(d)
Tree aboveground biomass (kg) on MP
200
160
120
80
40
0
Salvaged
Unsalvaged

Cent. Eur. For. J. 66 (2020) 159–169 sciendo DOI: 10.2478/forj-2020-0013

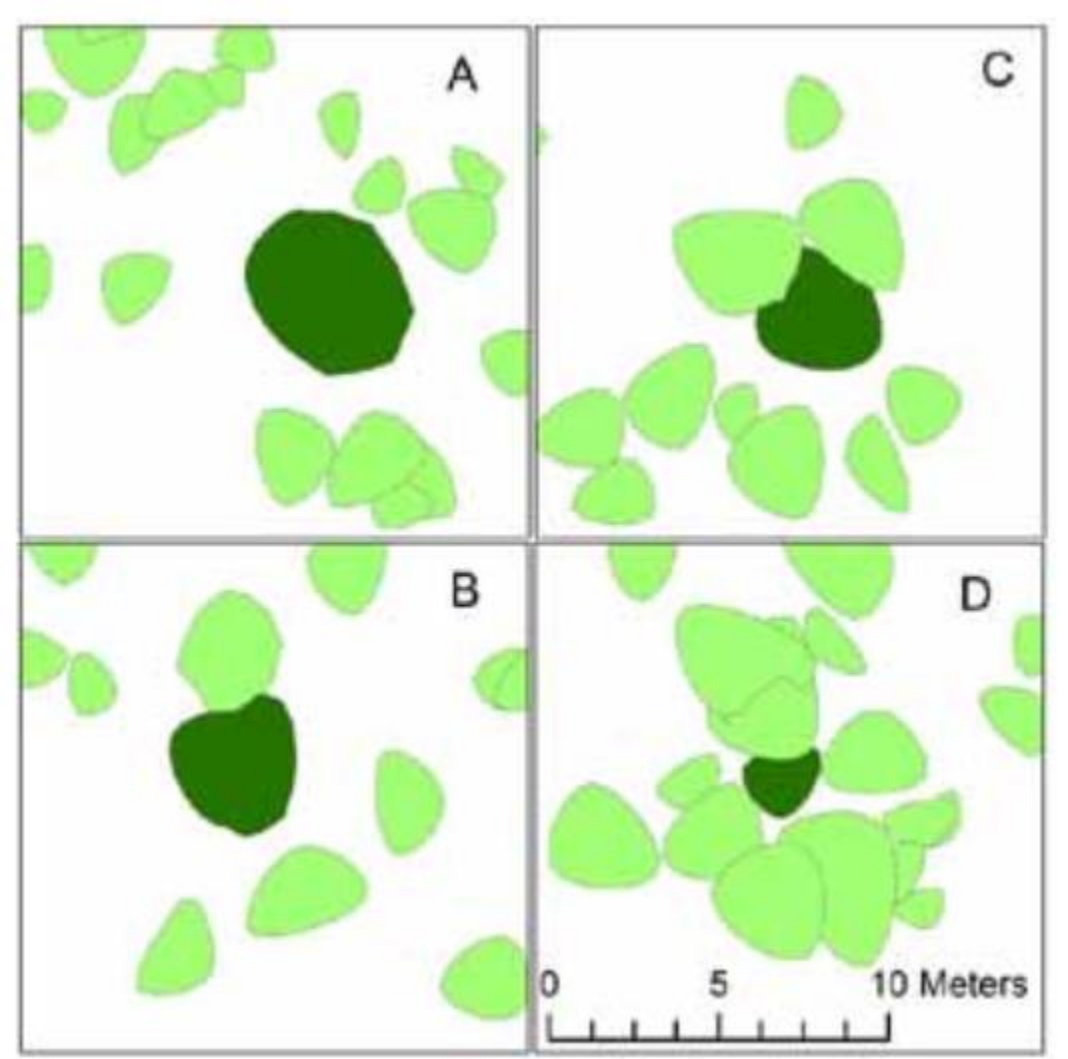
CENTRAL EUROPEAN Forestry Journal

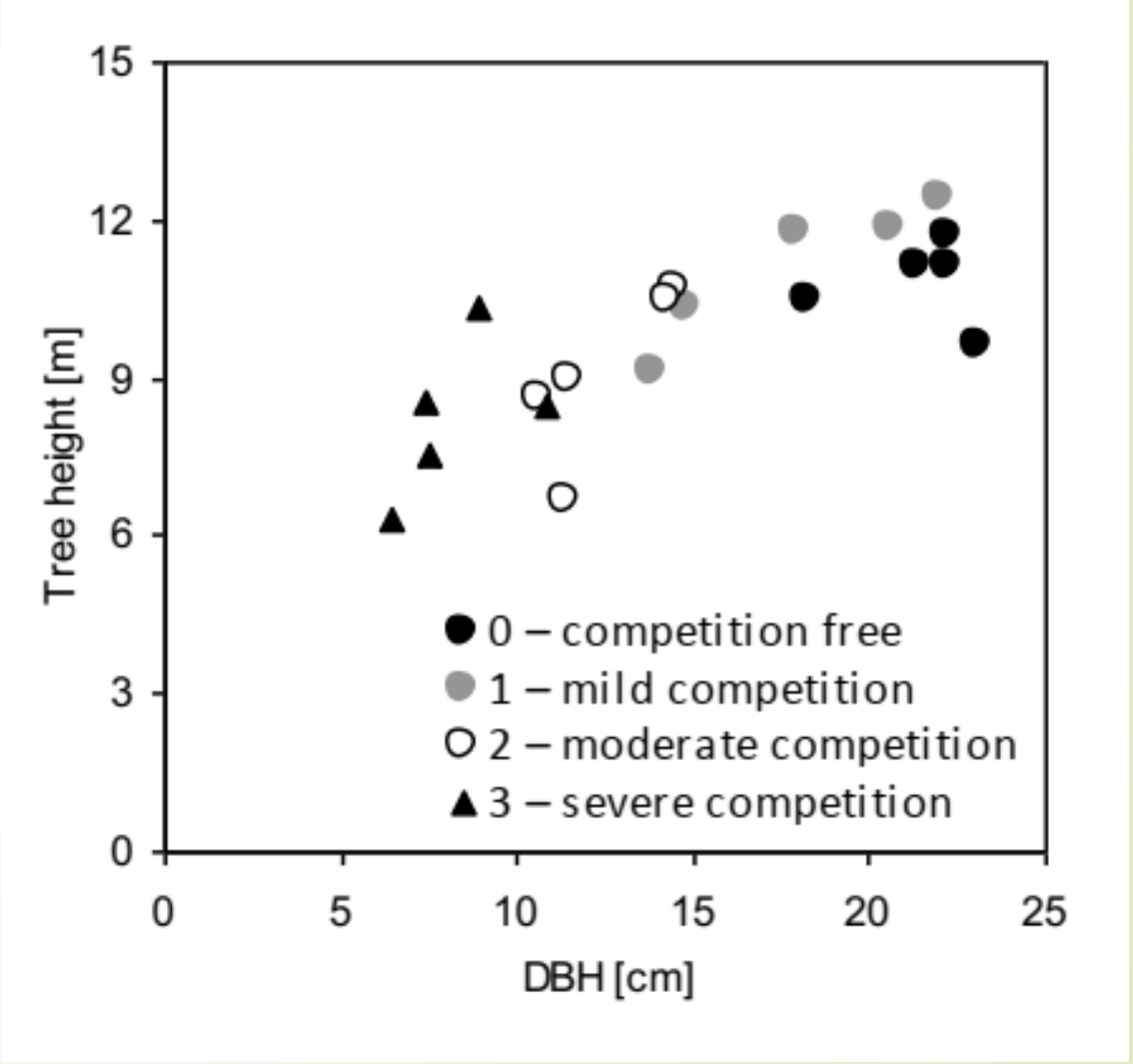
http://www.nlcsk.sk/fj/

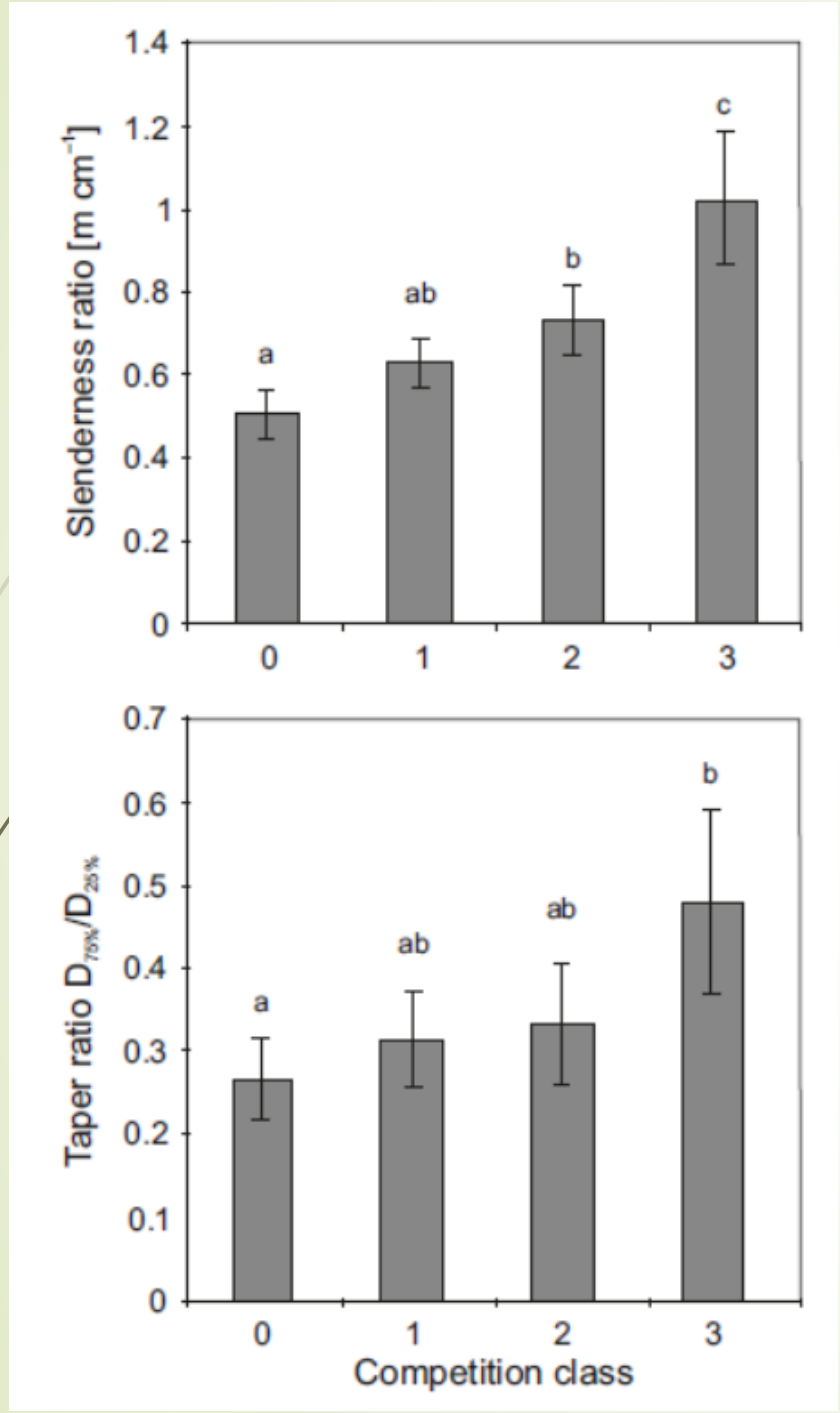
ORIGINAL PAPER

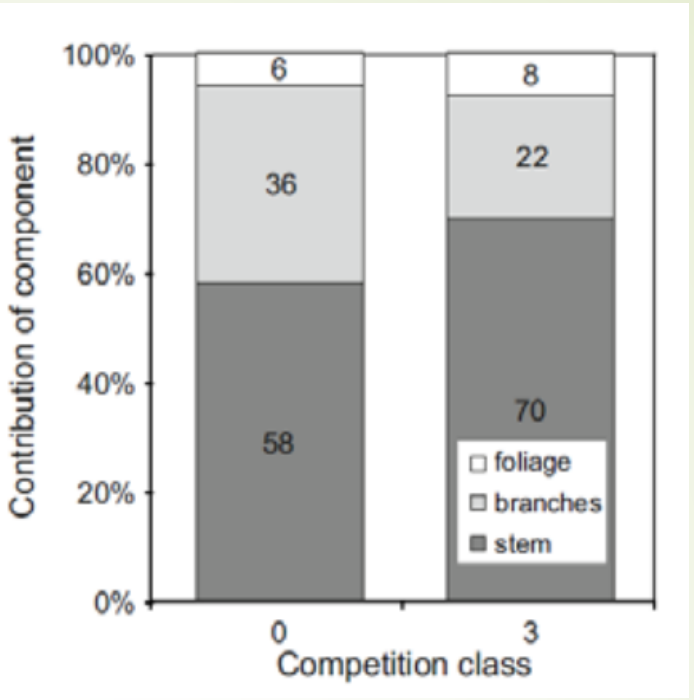
Silver birch aboveground biomass allocation pattern, stem and foliage traits with regard to intraspecific crown competition

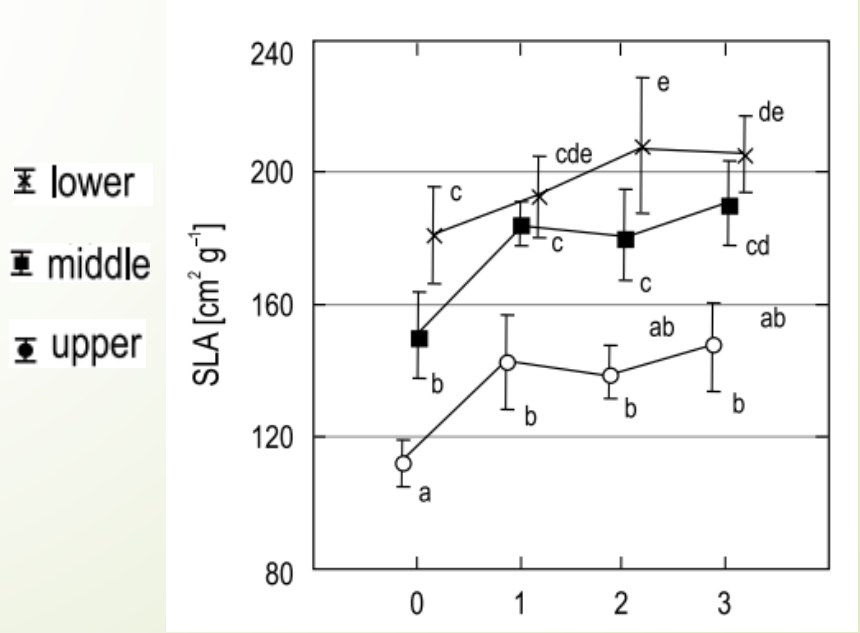
Bohdan Konôpka[1, 2]*, Jozef Pajtík[1], Vladimír Šebeň[1], Katarína Merganičová[2, 3], Peter Surový[2]


A
C
B
D
0
5
10 Meters


Tree height [m]
DBH [cm]
0
3
6
9
12
15
0
5
10
15
20
25
0 – competition free
1 – mild competition
2 – moderate competition
3 – severe competition


Slenderness ratio [m cm⁻¹]
1.4
1.2
1
0.8
0.6
0.4
0.2
0
a
ab
b
c
0
1
2
3
Taper ratio D75%/D25%
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
a
ab
ab
b
0
1
2
3
Competition class


Contribution of component
100%
80%
60%
40%
20%
0%
6
36
58
8
22
70
foliage
branches
stem
0
3
Competition class


lower
middle
upper
SLA [cm² g⁻¹]
240
200
160
120
80
a
b
b
b
b
c
cde
c
c
e
de
cd
ab
ab
0
1
2
3

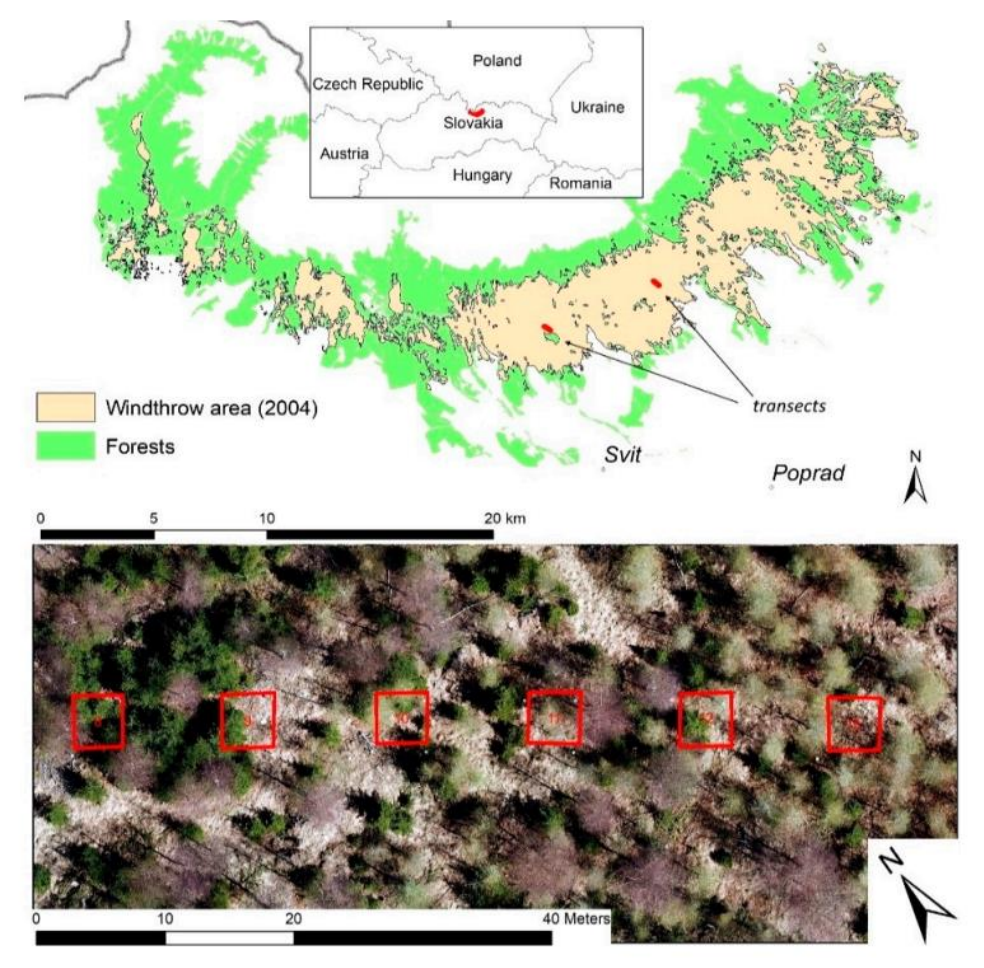
forests

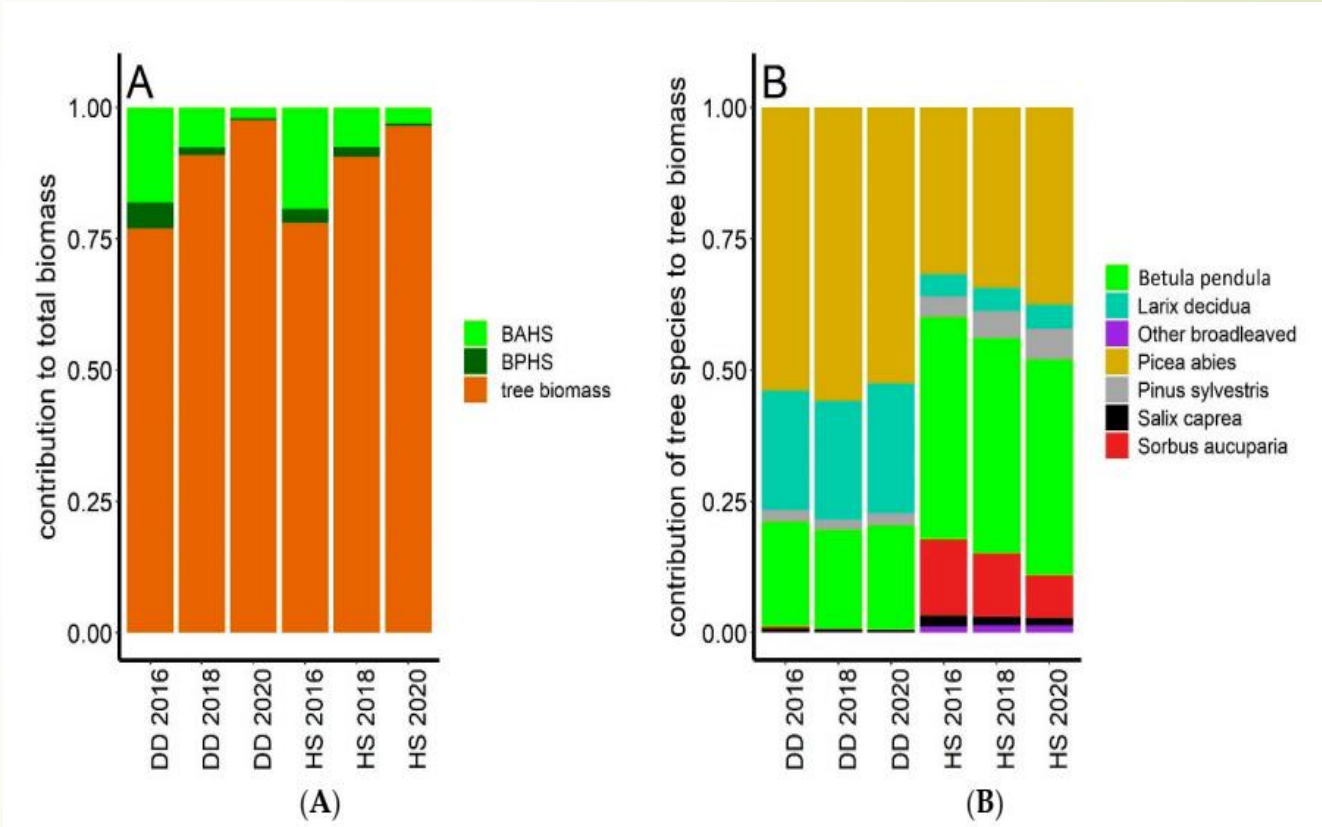
MDPI

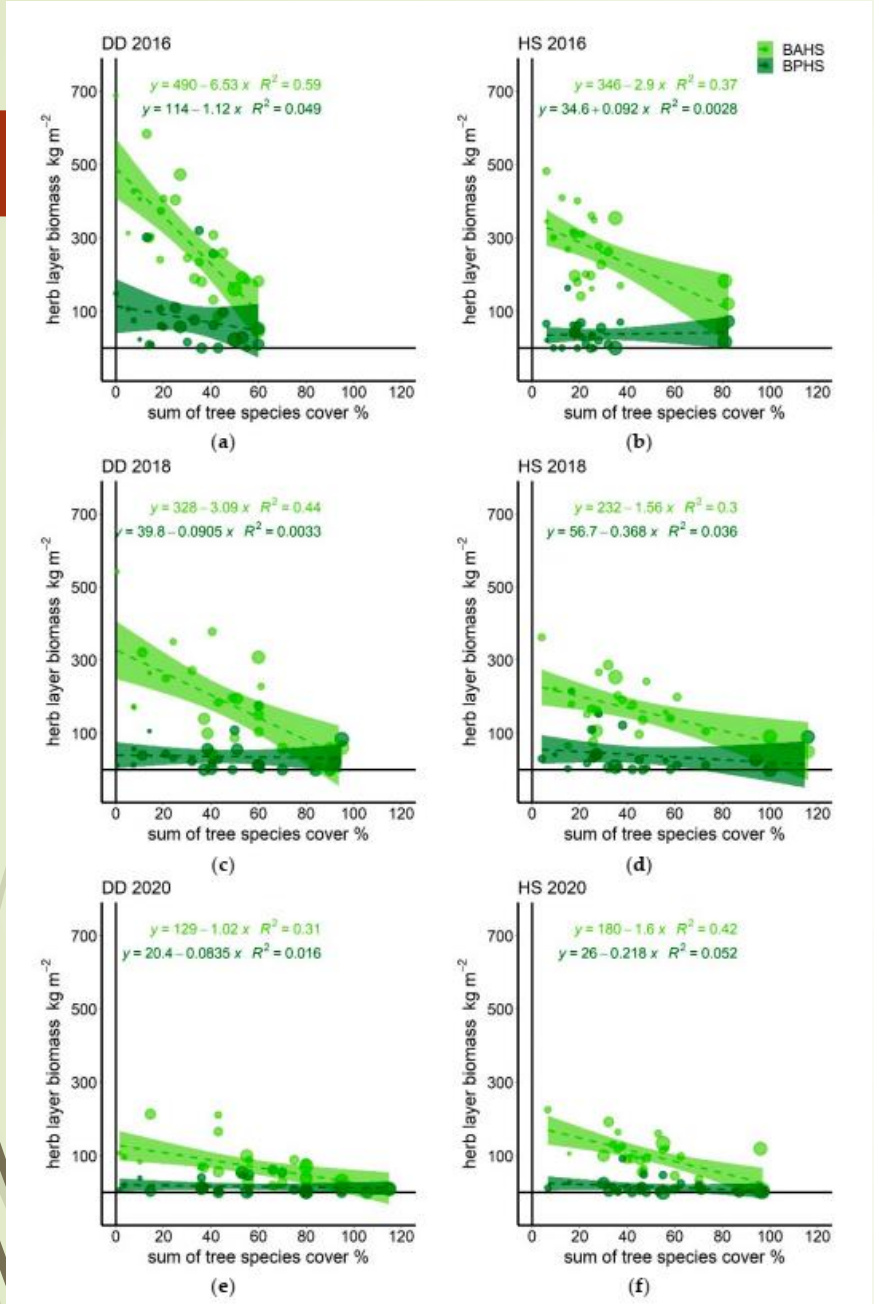
Article

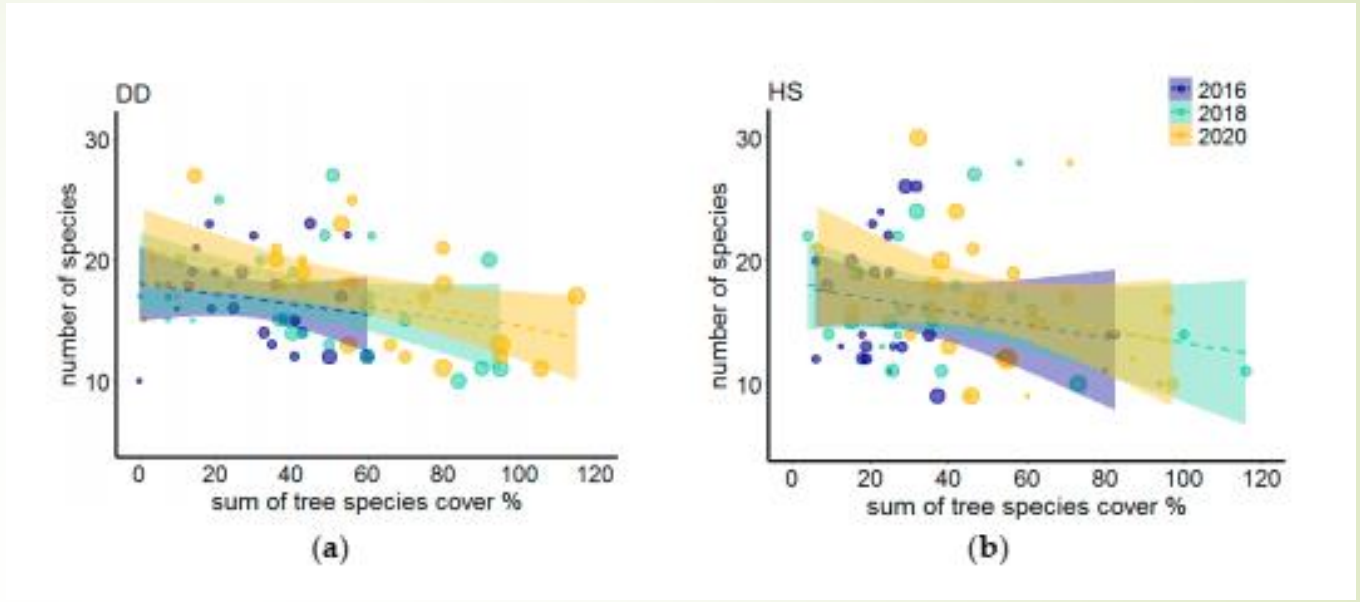
Short-Term Dynamics of Vegetation Diversity and Aboveground Biomass of *Picea abies* (L.) H. Karst. Forests after Heavy Windstorm Disturbance

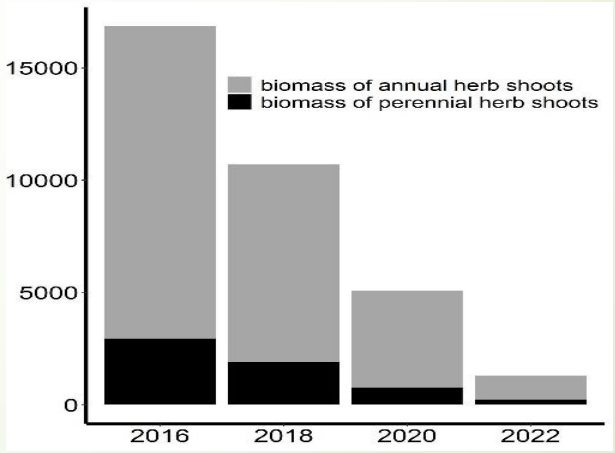
František Máliš [1,2], Bohdan Konôpka [2,3], Vladimír Šebeň [2,*], Jozef Pajtík [2] and Katarína Merganičová [3,4]


Poland
Czech Republic
Slovakia
Ukraine
Austria
Hungary
Romania
Windthrow area (2004)
Forests
transects
Svit
Poprad
N
0 5 10 20 km
0 10 20 40 Meters
N


A
contribution to total biomass
1.00
0.75
0.50
0.25
0.00
DD 2016
DD 2018
DD 2020
HS 2016
HS 2018
HS 2020
BAHS
BPHS
tree biomass
(A)
B
contribution of tree species to tree biomass
Betula pendula
Larix decidua
Other broadleaved
Picea abies
Pinus sylvestris
Salix caprea
Sorbus aucuparia
(B)


DD 2016
HS 2016
BAHS
BPHS
y = 490 – 6.53 x R² = 0.59
y = 114 – 1.12 x R² = 0.049
y = 346 – 2.9 x R² = 0.37
y = 34.6 + 0.092 x R² = 0.0028
DD 2018
HS 2018
y = 328 – 3.09 x R² = 0.44
y = 39.8 – 0.0905 x R² = 0.0033
y = 232 – 1.56 x R² = 0.3
y = 56.7 – 0.368 x R² = 0.036
DD 2020
HS 2020
y = 129 – 1.02 x R² = 0.31
y = 20.4 – 0.0835 x R² = 0.016
y = 180 – 1.6 x R² = 0.42
y = 26 – 0.218 x R² = 0.052
herb layer biomass kg m⁻²
sum of tree species cover %
(a)
(b)
(c)
(d)
(e)
(f)


DD
HS
2016
2018
2020
number of species
sum of tree species cover %
(a)
(b)


biomass of annual herb shoots
biomass of perennial herb shoots
2016
2018
2020
2022

forests

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Article

Excluding Large Wild Herbivores Reduced Norway Spruce Dominance and Supported Tree Species Richness in a Young, Naturally Regenerated Stand

Bohdan Konôpka [1,2], Vladimír Šebeň [1,*], Jozef Pajtík [1] and Lisa A. Shipley [3]

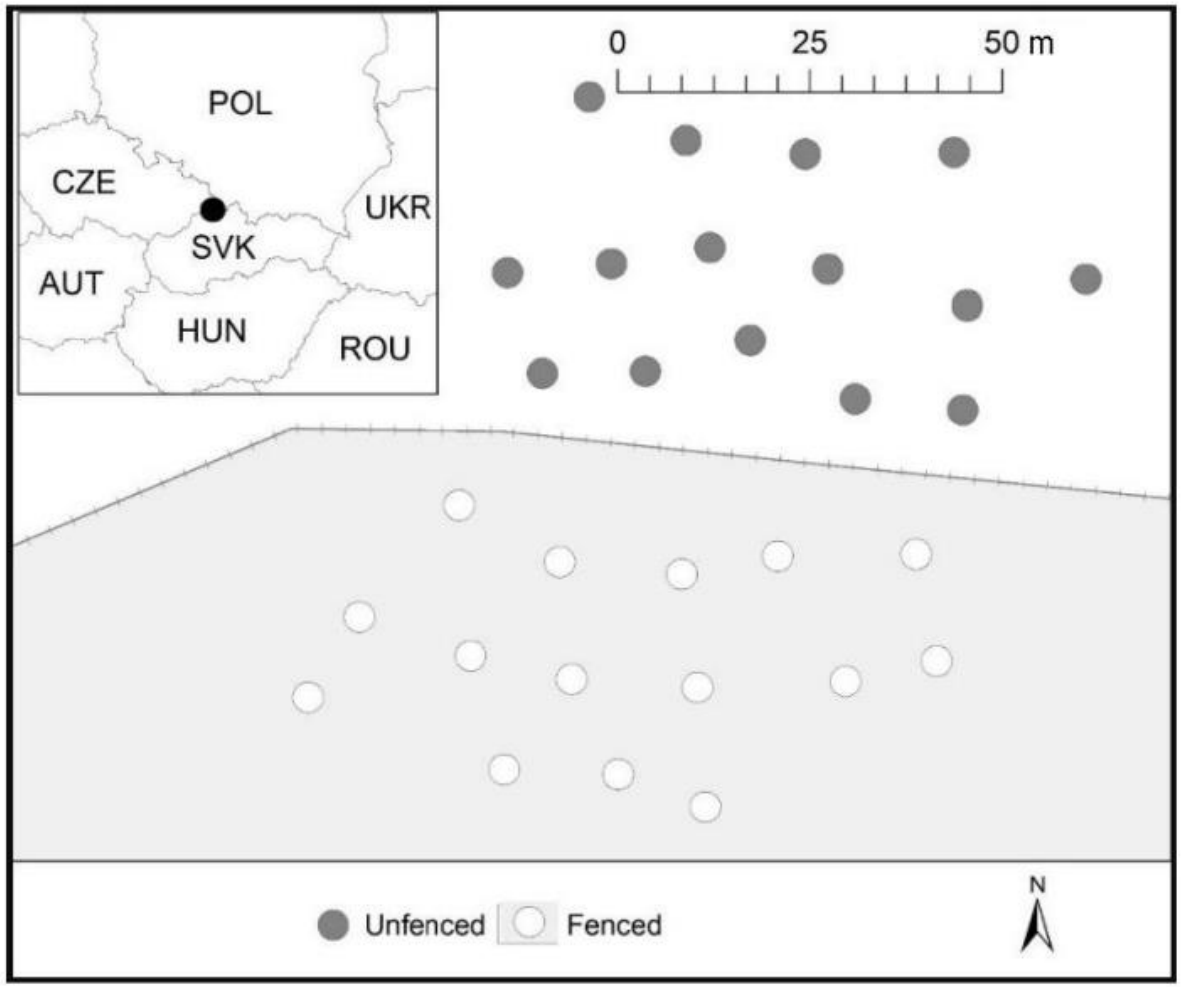


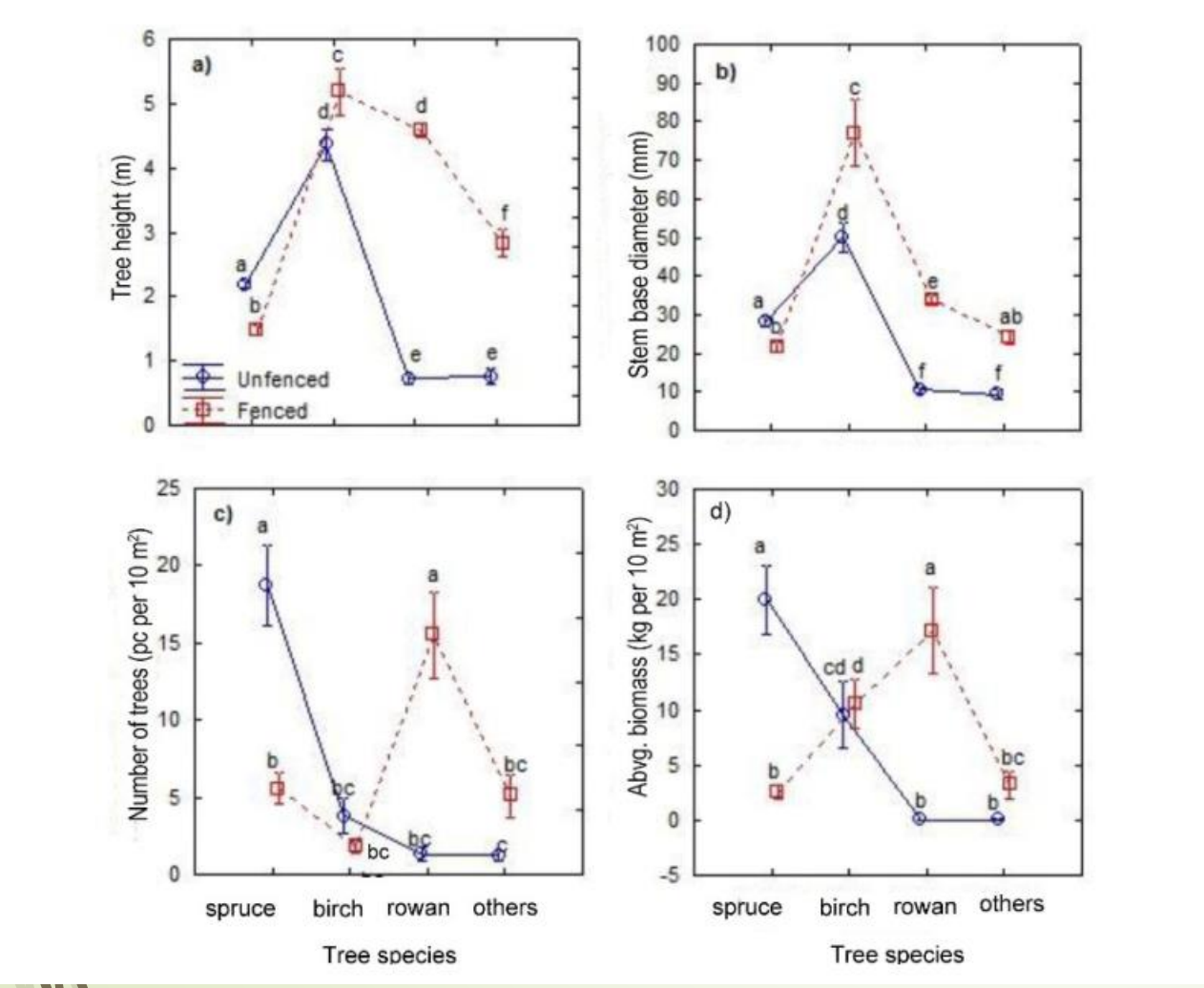
Table 1. Coefficients (b_0, b_1, b_2) and correction factors (λ for allometric equations (Formula (1)) expressing aboveground tree biomass based on stem base diameter and tree height as independent variables.

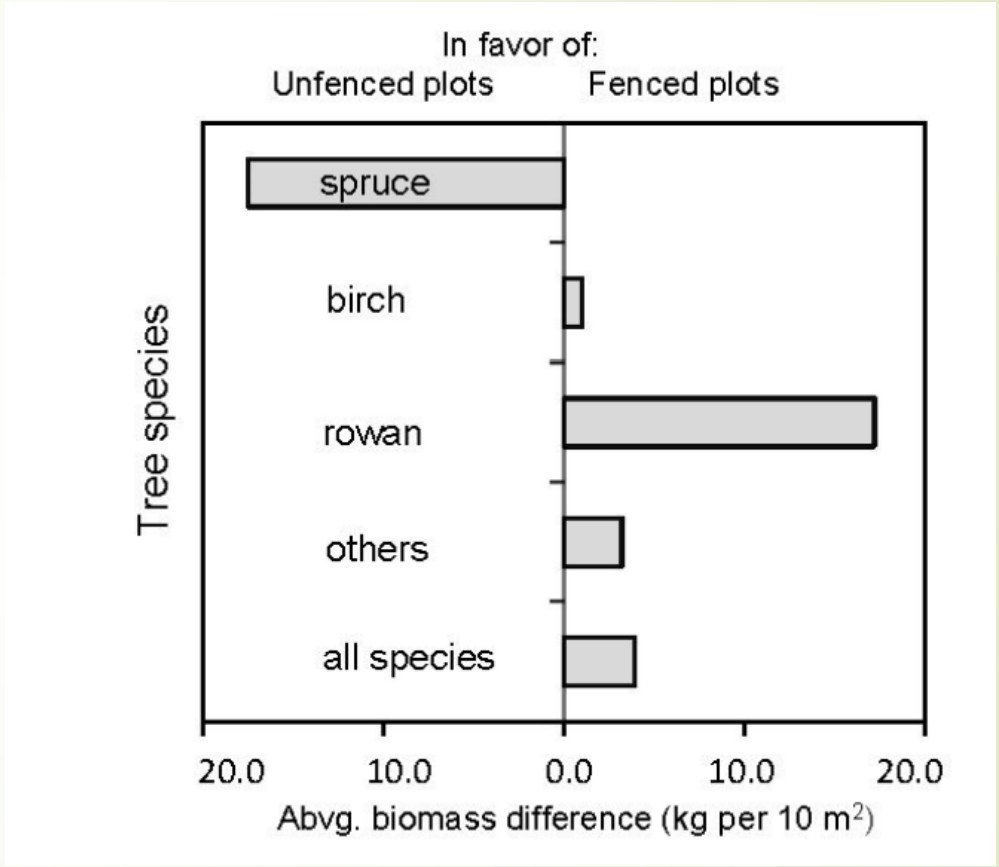
Tree Species	b0	b1	b2	λ	Source
Norway spruce	−0.579	2.039	0.297	1.030	I
Silver birch	−1.545	2.032	0.586	1.033	II
Common rowan	−1.586	2.262	0.299	1.018	I
Sycamore maple	−1.04	1.998	0.549	1.024	I
Goat willow	−0.705	1.81	0.815	1.021	I
Silver fir *	−0.579	2.039	0.297	1.030	I
European beech	−1.236	2.124	0.521	1.038	I
Trembling aspen	−1.434	2.177	0.434	1.031	I
European ash	−0.589	1.838	0.754	1.032	I

I—models from Pajtík et al., 2018; II—own unpublished data; * Silver fir was calculated by using equation derived for Norway spruce.

Table 3. F values and *p* values from two-way ANOVA for basic stand characteristics considering treatment (unfenced vs. fenced) and tree species (includes Norway spruce, silver birch, common rowan, and others) and their combined effect on the stand characteristics.

Variable	Factor	F-Value	*p*-Value
Tree height (m)	Treatment	93.56	<0.001
	Species	85.74	<0.001
	Treatment × species	55.74	<0.001
Stem base diameter (mm)	Treatment	51.59	<0.001
	Species	98.94	<0.001
	Treatment × species	23.43	<0.001
Number of trees per 10 m^2	Treatment	0.43	0.512
	Species	16.94	<0.001
	Treatment × species	27.45	<0.001
Aboveground biomass per 10 m^2	Treatment	0.36	0.549
	Species	7.11	<0.001
	Treatment × species	19.46	<0.001


a)
b)
c)
d)
Tree height (m)
Stem base diameter (mm)
Number of trees (pc per 10 m²)
Abvg. biomass (kg per 10 m²)
Unfenced
Fenced
spruce
birch
rowan
others
Tree species


In favor of:
Unfenced plots
Fenced plots
Tree species
spruce
birch
rowan
others
all species
20.0
10.0
0.0
10.0
20.0
Abvg. biomass difference (kg per 10 m²)

plants

MDPI

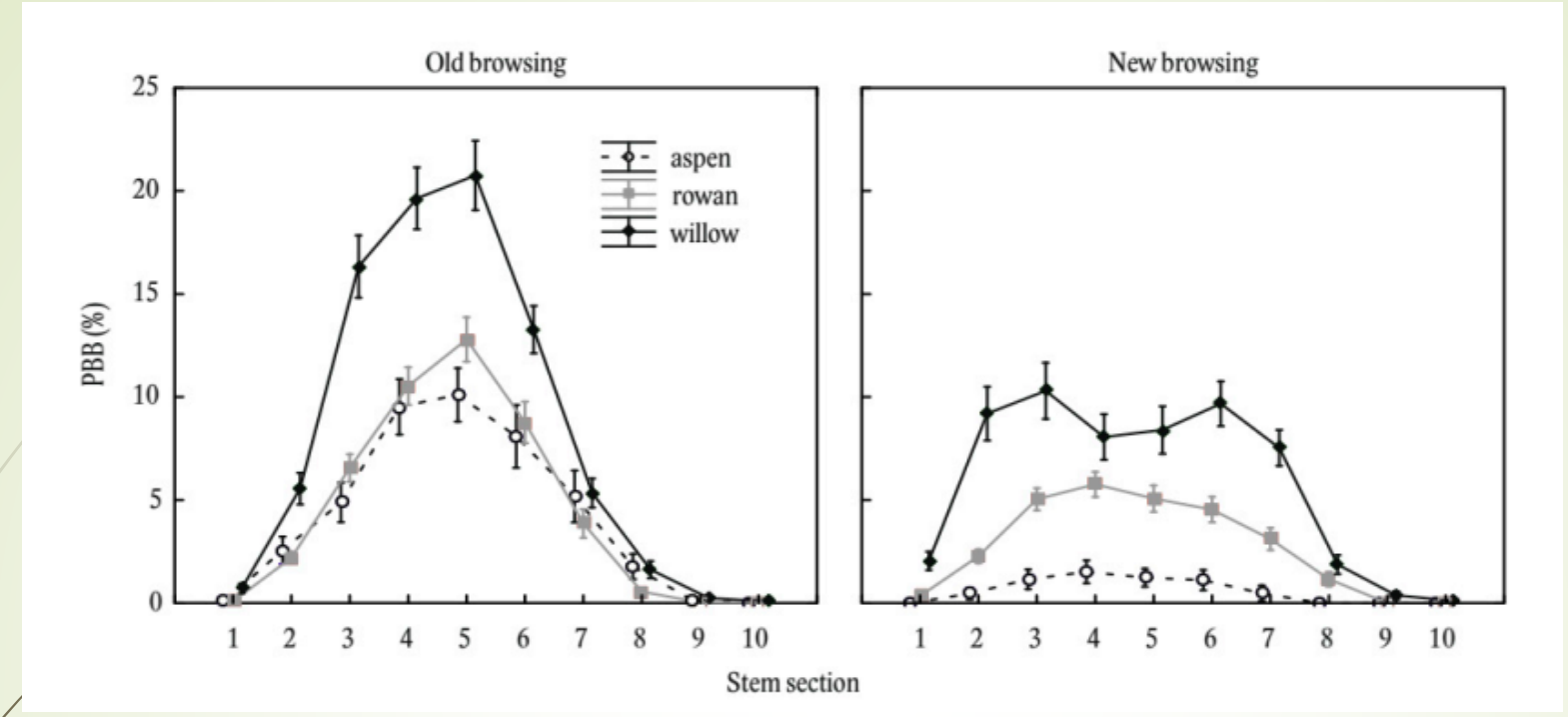
Article

Influence of Tree Species and Size on Bark Browsing by Large Wild Herbivores

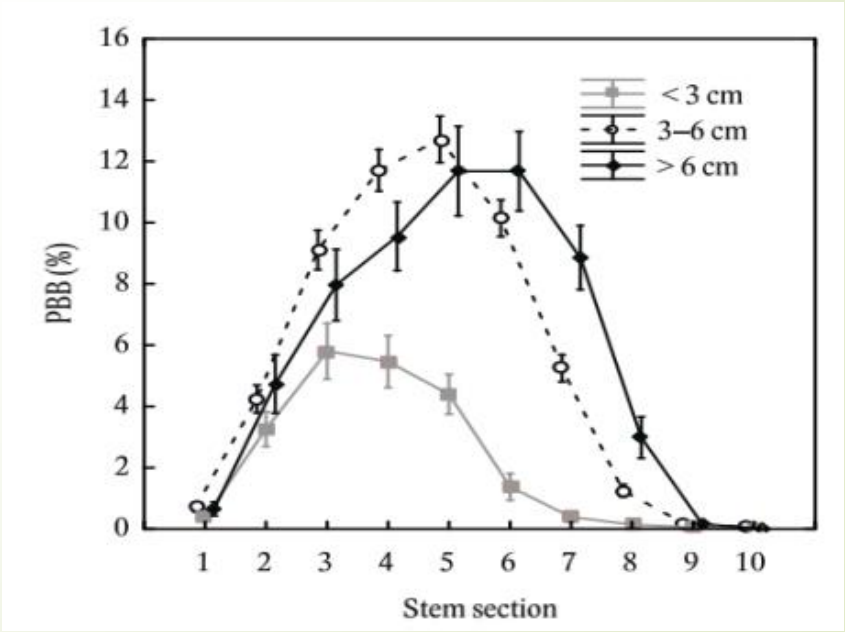
Bohdan Konôpka [1,2], Vladimír Šebeň [1,*], Jozef Pajtík [1] and Lisa A. Shipley [3]

Table 2. Mean share of browsed trees on total number of measured trees (%) and mean browsed area (cm^2, in brackets) calculated for the set of browsed trees separately for old (years 2019 and 2020) and new (year 2021) bark damage by large wild herbivores by stem section on common aspen (*Populus tremula* L.), common rowan (*Sorbus aucuparia* L.) and goat willow (*Salix caprea* L.).

Stem Section (cm)	Common Aspen		Common Rowan		Goat Willow	
	Old Browsing	New Browsing	Old Browsing	New Browsing	Old Browsing	New Browsing
0–25	4.3 (12.2)	0	5.0 (9.2)	11.6 (18.9)	14.2 (27.9)	27.5 (43.9)
26–50	37.1 (38.9)	5.7 (25.6)	46.3 (27.9)	42.1 (31.4)	57.5 (49.0)	51.7 (101.0)
51–75	58.6 (49.9)	10.0 (47.1)	62.8 (58.3)	56.2 (44.4)	80.8 (102.0)	55.0 (106.1)
76–100	72.9 (80.7)	13.1 (49.5)	71.1 (80.2)	57.0 (48.0)	89.2 (113.6)	53.3 (82.9)
101–125	80.0 (84.5)	12.9 (38.6)	72.1 (97.3)	48.9 (45.7)	89.6 (123.6)	56.7 (80.1)
126–150	57.1 (101.7)	10.0 (60.2)	54.5 (90.7)	47.9 (44.8)	80.0 (91.4)	64.2 (82.2)
151–175	34.3 (113.9)	4.3 (68.2)	31.4 (74.1)	33.9 (50.7)	49.2 (61.3)	57.5 (71.5)
176–200	14.3 (90.3)	0	9.9 (29.2)	12.4 (58.2)	19.2 (43.2)	20.0 (51.8)
201–225	4.3 (30)	0	0.8 (13.8)	0	4.2 (23.1)	4.2 (46.3)
226–250	0	0	0.8 (7.4)	0	1.7 (18.4)	0.8 (59.2)
Full stem profile	87.1 (323.5)	21.4 (123.4)	77.7 (174.4)	79.3 (320.8)	97.5 (450.2)	87.5 (368.2)



1: 0–25 cm, 2: 26–50 cm, 3: 51–75 cm, 4: 76–100 cm, 5: 101–125 cm, 6: 126–150 cm, 7: 151–175 cm, 8: 176–200 cm, 9: 2: 201–225 cm, and 10: 226–250 cm from the ground level.



AGENTÚRA NA PODPORU VÝSKUMU A VÝVOJA

Agentúre ďakujeme za financovanie nášho výskumu v rámci projektu APVV-18-0086!

Milým poslucháčom ďakujeme za pozornosť!