

CHANGES OF FOREST UNDERSTORY VEGETATION ARE DRIVEN BY DISTURBANCES:

Intensive Monitoring of Slovenian forests



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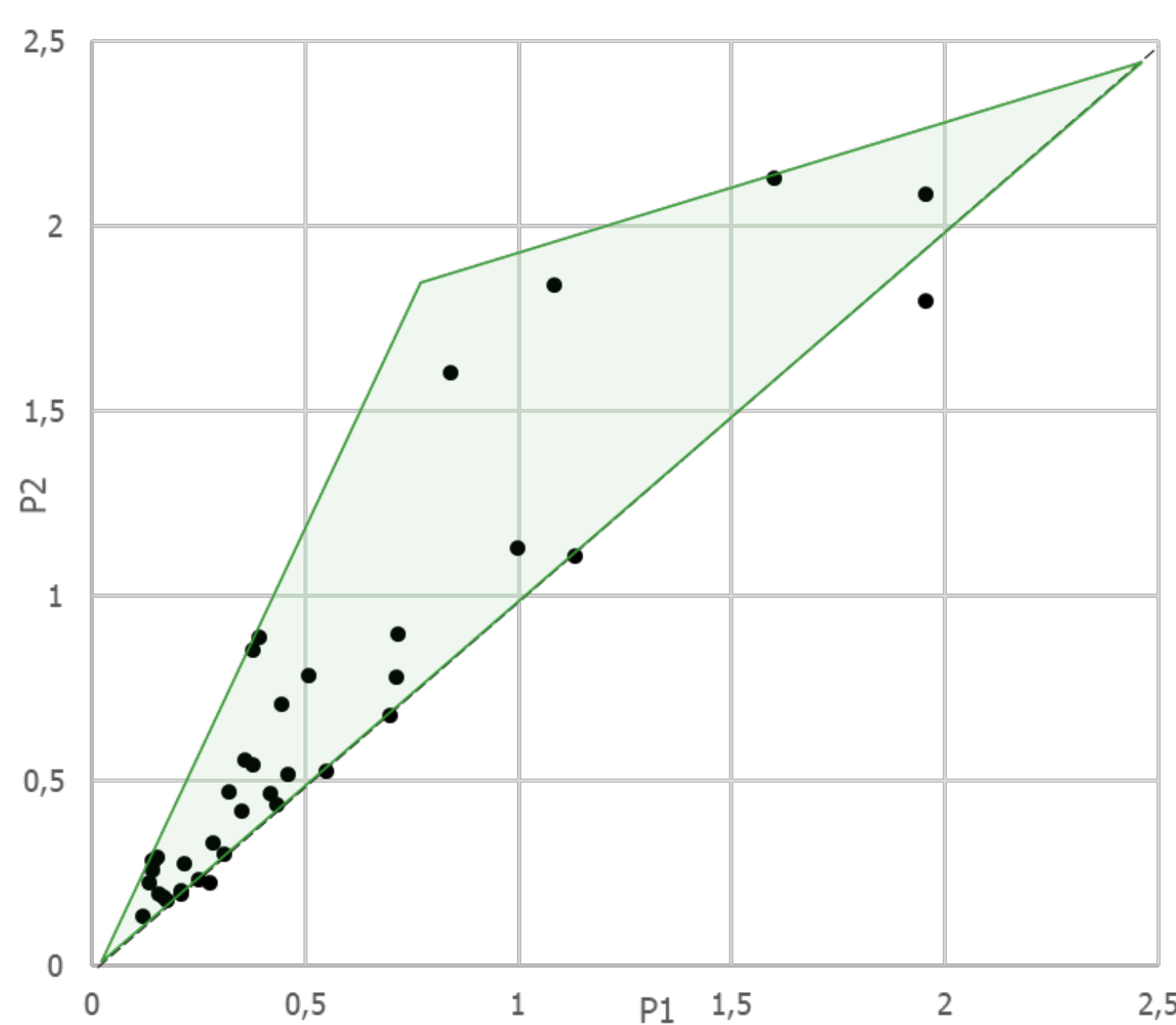
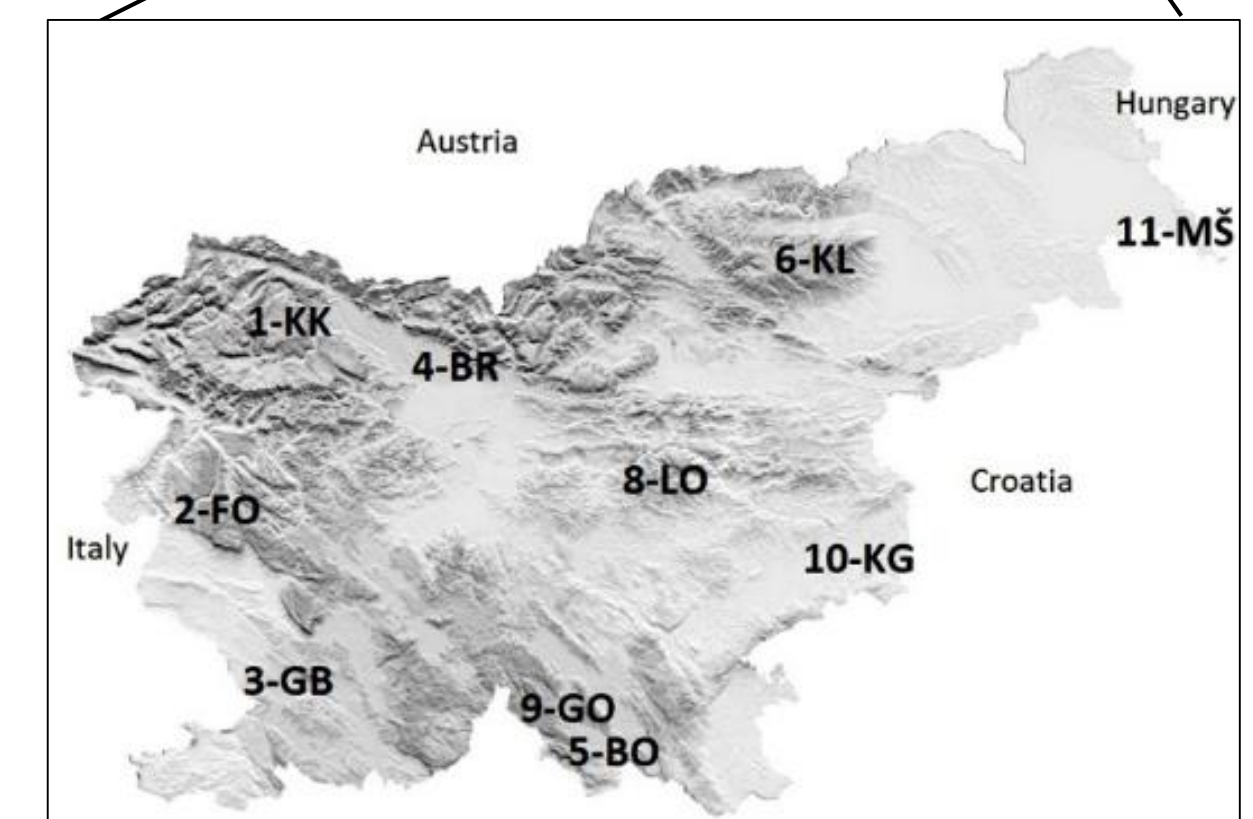
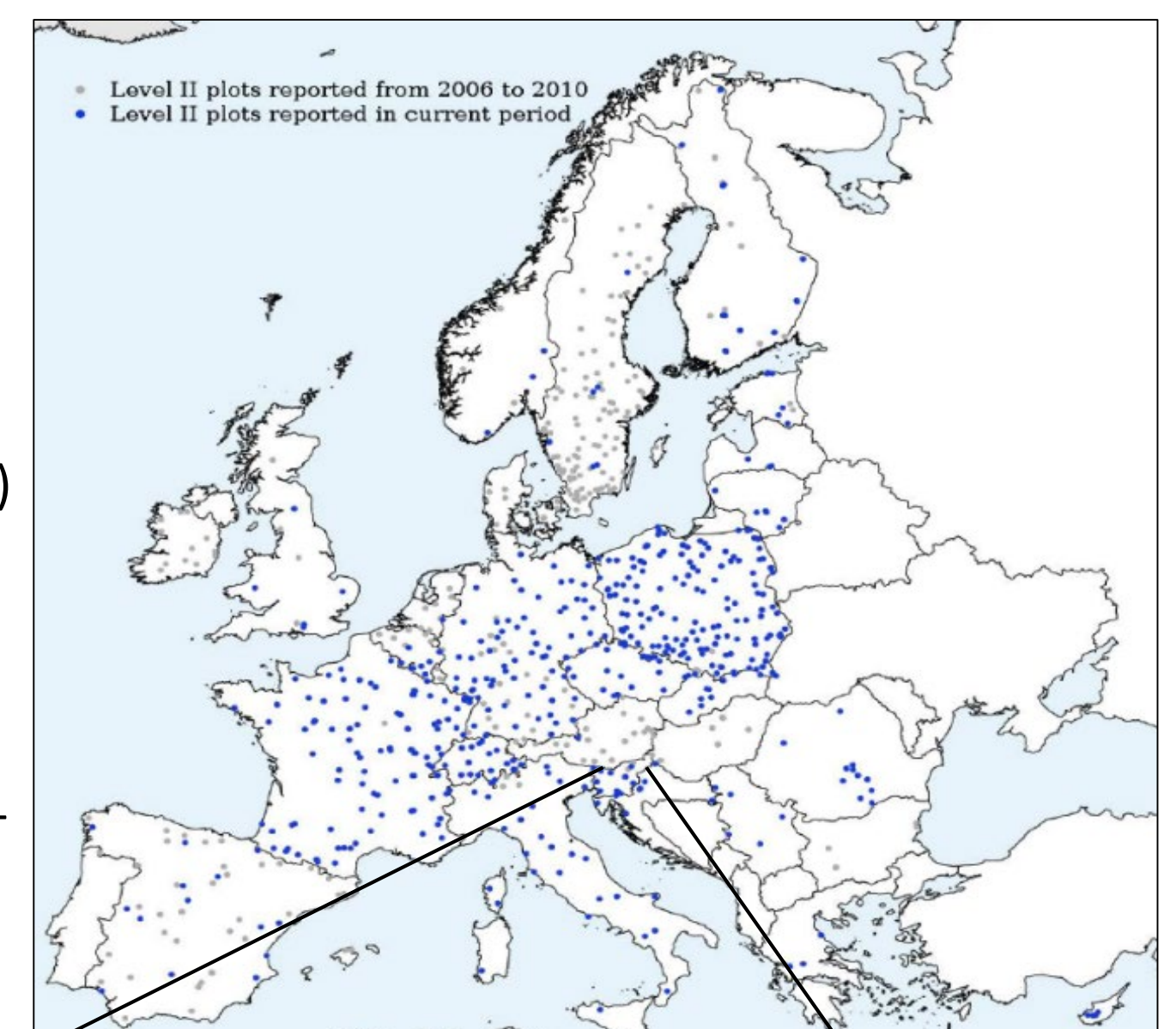
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In this study, we quantified changes in the diversity and composition of the forest understory layer in the Slovenian Intensive Monitoring (Level II) sites between 2004/05 (P1) and 2014/15 (P2). In total, 60 plots were placed across 10 different managed forest types, ranging from lowland deciduous and mid-altitude mesic mixed forests to mountain conifer forests.

To examine how disturbance influenced understory dynamics, we estimated the disturbance impacts considering both natural and/or anthropogenic disturbances that cause significant damage to trees and to ground-surface layers, including ground-vegetation layers and upper-soil layers.

- 723 Intensive Monitoring (IM) sites (plots) in Europe (ICP-Forests) for ground vegetation assessment.
- In Slovenia, 11 IM sites were selected and surveyed in 2004/2005.
- In 2014/2015, ground vegetation were re-surveyed in 60 plots across 10 IM sites.



Cover of the most common plant species. Black dots indicate 38 common plant species in herb and shrub layer.

The mean value of disturbance estimates per site (Dist.) increased from 0.8% in 2004/05 to 16.3% in 2014/15, which corresponded to a reduction in total vegetation cover, including tree-layer cover (Tab.).

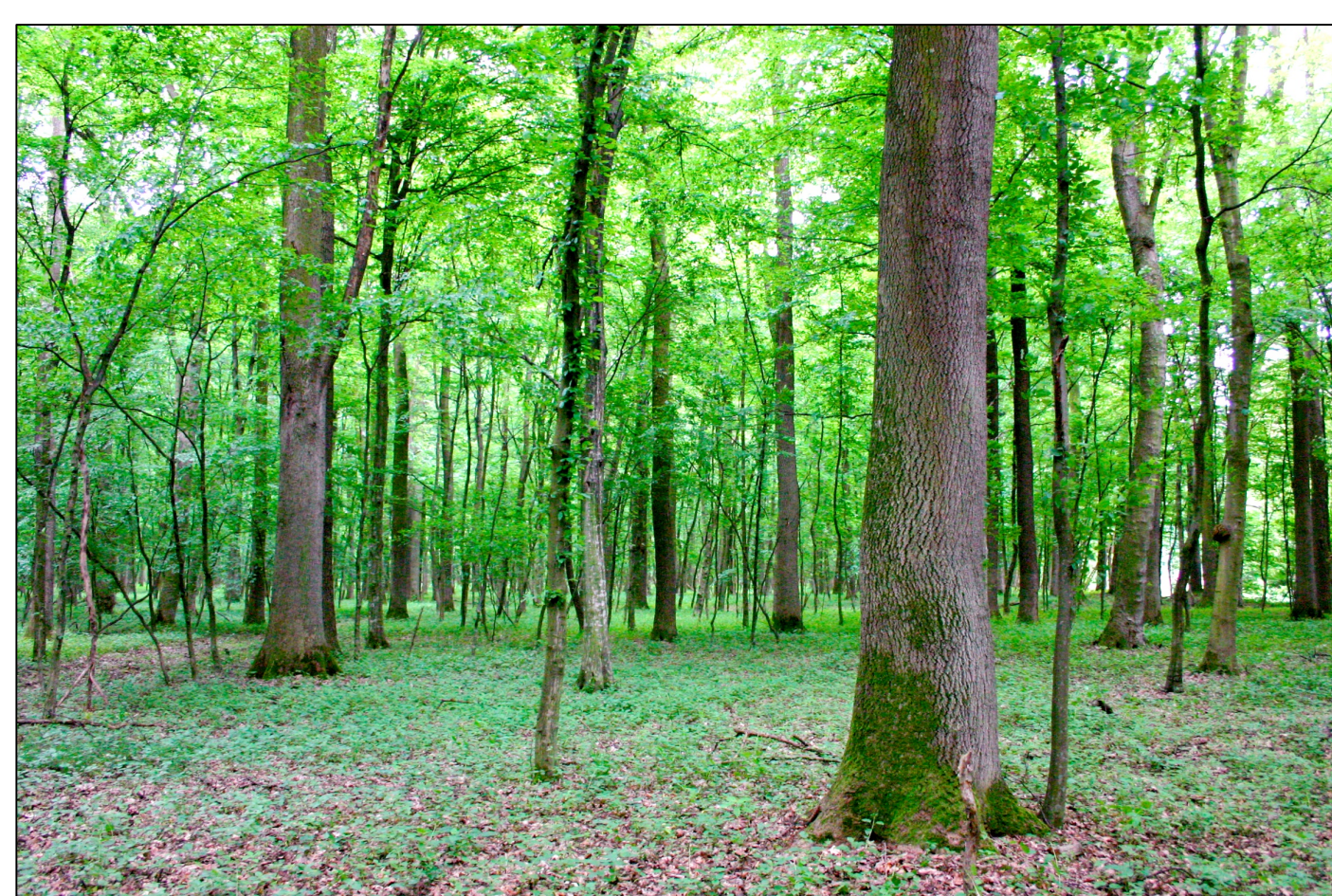
Species richness across 10 sites (gamma diversity) significantly decreased during the study period (from 273 to 244 species), while mean species richness per site (N) did not significantly change (Tab.).

The mean value of Shannon diversity (H') and evenness (E) significantly increased (Tab.).

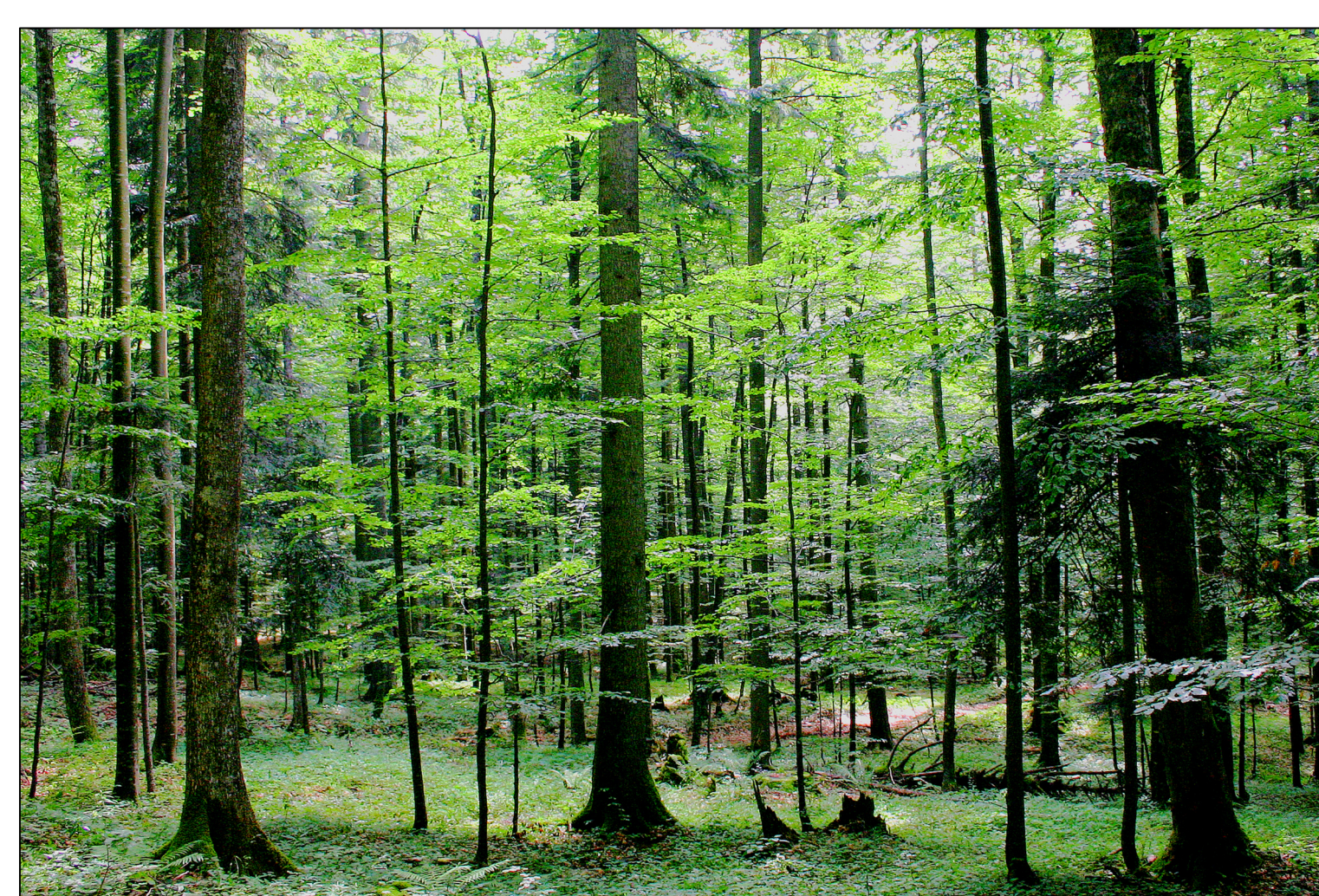
Cover of the most common plant species increased during the monitoring period (Fig.).

Rather than observing an increase in plant diversity due to disturbance, our results suggest a short-term decrease in species number, likely driven by replacement of more specialized species with common species.

	Period 1 (2004/2005)	Period 2 (2014/2015)	
	Mean (in %)	Mean (in %)	Signif.
	(n=60)	(n=60)	
TOTAL VEGET. COVER	99.5	97.3	***
TREE-LAYER COVER	85.3	80.4	***
SHRUB-LAYER COVER	7.4	9.5	ns.
HERB-LAYER COVER	72.1	72.1	ns.
N OF SPECIES	37.6	37.7	ns.
EVENNESS E	0.56	0.60	***
SHANNON H'	1.94	2.11	***



11-MŠ (Murska šuma), 2005: Dist.=1%



9-GO (Gorica), 2005: Dist.=3%

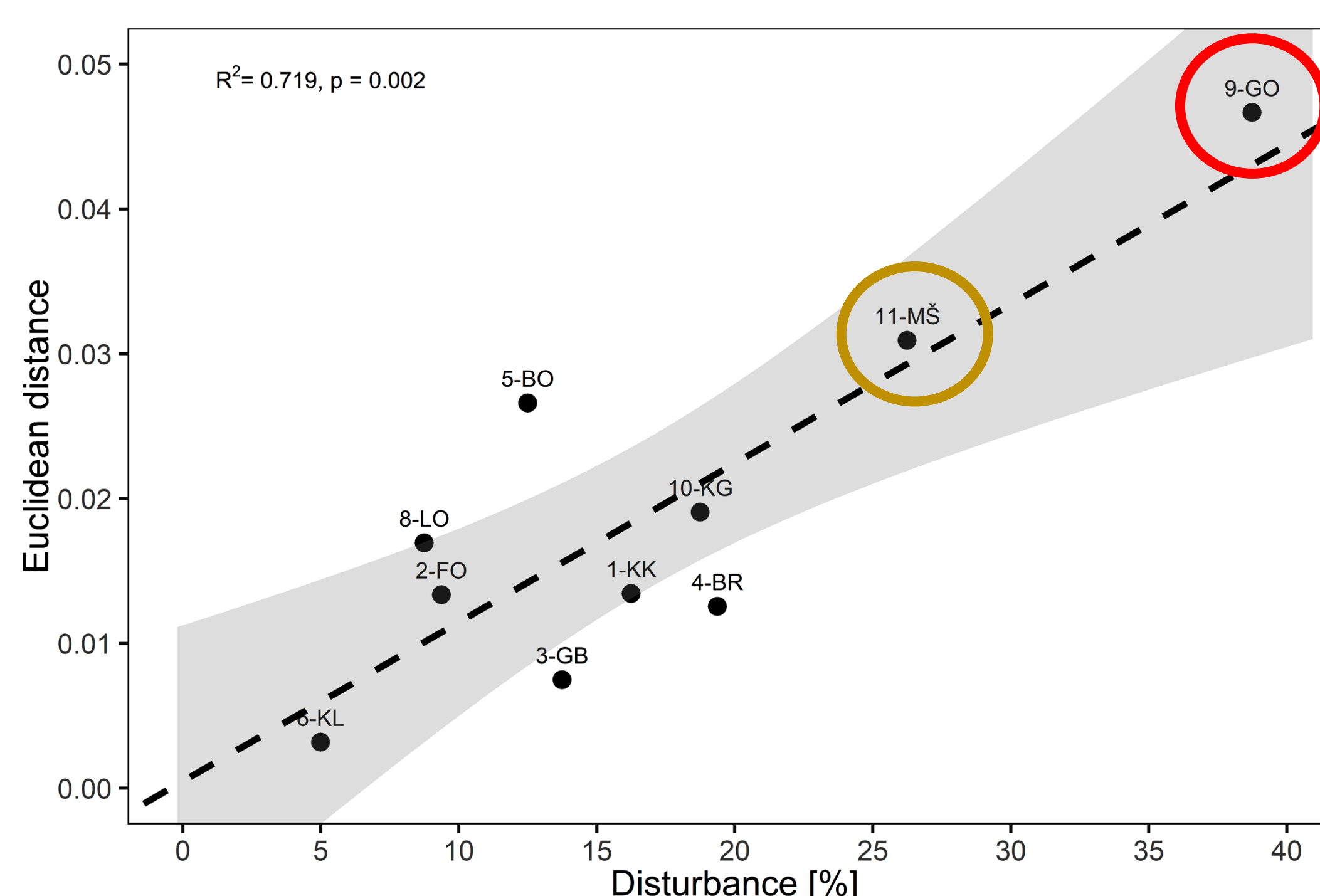


9-GO (Gorica), 2015: Dist.=39%



11-MŠ (Murska šuma), 2015: Dist.=26%

More disturbed sites showed larger temporal changes in species composition compared to less disturbed sites, suggesting that forest disturbances caused understory compositional shifts during the study period.



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