

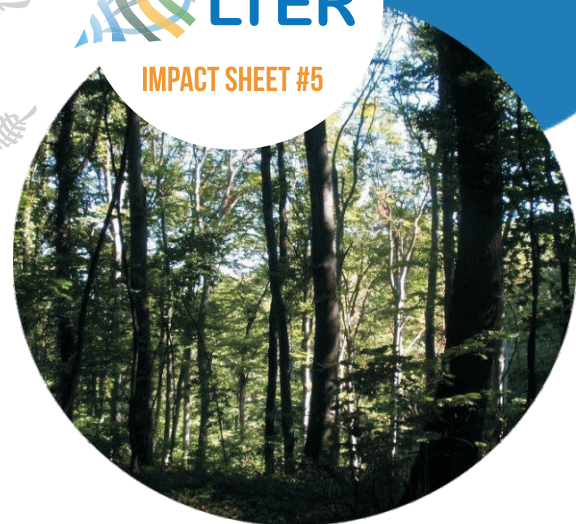
ECOLOGICAL AND ECONOMIC INDICATORS OF FOREST CHANGES INDUCED BY HUMAN DISTURBANCE

FRUŠKA GORA LTER SITE, SERBIA

Fruška Gora National Park is a mountain surrounded by flat land in Vojvodina, Northern Serbia, predominantly covered with temperate deciduous forest. The area has a long history of land use; its resources have been exploited for hundreds of years. Simultaneous reduction of forest cover and rock exploitation along with infrastructure development have changed the forest structure and tree species composition, led to fragmentation and greatly affected wildlife. The impact of forest clearance and old school forest practices such as clearcutting, is still evident decades after commercial logging ended.

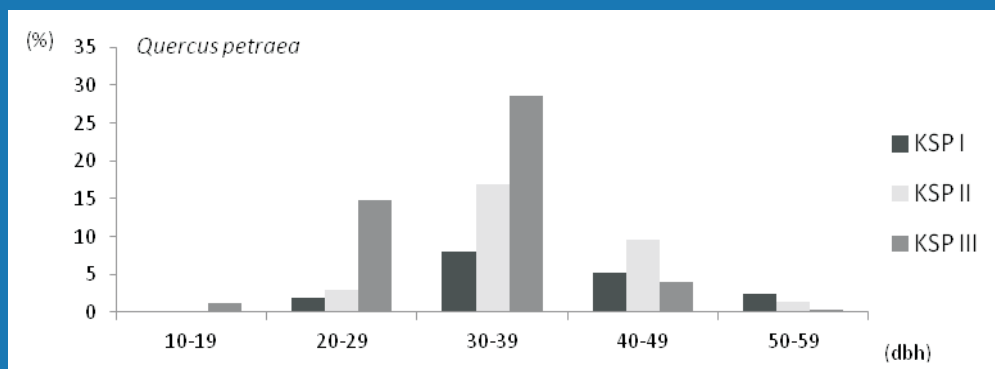


IMPACT SHEET #5



RESEARCH

Forest ecosystems are the source of multiple goods and services to humans, the provision of which is deemed to be conditioned by biodiversity. We have investigated biodiversity changes along different stages of forest disturbance in Fruška gora research site by observing quantitative (structural diversity, species diversity) and qualitative (species' functional traits) aspects. Parallel analysis of the provision level of certain forest products, resulting from the given forest state, was performed and expressed in monetary terms. The results indicate that biodiversity decreases with higher disturbance. Moreover, benefits accrue with higher biodiversity.



Example of data on the percentage of dominant tree species in different diameter classes in each research plot - *Quercus petraea*

The economic value of timber and non-timber forest products in three research plots: KSP I, KSP II and KSP III are research plots in the first, second and third level of protection

Ecosystem's product	KSP I		KSP II		KSP III	
	Wood volume (m ³ /ha)	Price/ha (stumpage value) (€)	Wood volume (m ³ /ha)	Price/ha (stumpage value) (€)	Wood volume (m ³ /ha)	Price/ha (stumpage value) (€)
Timber (species name)						
<i>Quercus petraea</i>	51,71	7101,53	75,22	8693,20	72,75	5893,91
<i>Fagus moesiaca</i>	59,03	3593,35	0,00	0,00	0,00	0,00
<i>Tilia spp.</i>	71,46	5053,74	33,61	1874,15	18,00	974,14
<i>Carpinus betulus</i>	2,17	65,82	0,61	16,03	2,73	82,00
Total	184,37	15.814,43	109,44	10.583,37	93,47	6.950,06
Medicinal plants and fruits	Total value (€)		Total value (€)		Total value (€)	
	34,53		6,32		1,76	
Total value for products (€)	15.848,96		10.589,69		6.951,82	

FRUŠKA GORA, LTER, SERBIA



AIMS

To demonstrate the value of biodiversity by depicting changes at the provision level of two types of forest products (timber and non-timber), resulting from forest structure and composition changes due to different levels of human disturbance.

OUTCOME - IMPACT

- The observed changes in biodiversity components are accompanied by lowered provision of both types of forest products, expressed as their lowered economic value per hectare.
- This indicates that the production level is dependent on the ecosystem state, and that higher benefits accrue, where biodiversity is higher.



Further research is aimed at tracking plant responses to human disturbances (mainly logging).

By collecting the leaves in the areas differently affected by human activities and measuring a chosen set of leaf functional traits, we are tracking plant responses to these disturbances. Different species may respond differently to habitat change i.e. different disturbance level.



PRIORITY THEMES



BIODIVERSITY



WATER



PRODUCTION



SERVICES



INNOVATION



PLANNING /
MANAGEMENT



SOCIETY



RESILIENCE



OTHER?

PRIORITY ECOSYSTEM SERVICES

PROVISIONING

WOOD PRODUCTION

REGULATING

CARBON SEQUESTRATION

CULTURAL

SUPPORTING

AREA OF RELEVANCE, ACCORDING TO SDG



13 CLIMATE ACTION



3 GOOD HEALTH AND WELL-BEING



15 LIFE ON LAND

SDG - UN SUSTAINABLE DEVELOPMENT GOALS

FURTHER INFORMATION

Mészáros M et al. Possibilities of applying CORONA archive satellite images in forest cover change detection – example of the Fruška Gora mountain. Geographica Pannonica. 2014. Volume 18, Issue 4, 96-101