

DEGREE OF LANDSCAPE FRAGMENTATION IN SPECIALLY PROTECTED AREAS

Background for management



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INTRODUCTION & OBJECTIVES

- Landscape fragmentation is a process of sub/dividing of landscape units into smaller segments by fragmentation geometry
- One of the negative consequences is the disruption and loss of natural habitats of (not only) priority protection species
- The objective is to evaluate the development of degree of landscape fragmentation for protected areas since the 1950s to present
- In this study, **fragmentation geometry** is derived from anthropogenic elements – urban areas, roads and pathways

DATA & METHODOLOGY

- We used old topographic maps*, base maps of Czechia** and maps of national traffic census*** to create database of fragmentation geometry
- Landscape fragmentation was measured by *Effective Mesh Size* (Jaeger, 2000, Moser et al. 2007, Girvetz et al., 2008) transformed to Python script

$$m_{\text{eff}}^{\text{CBC}}(j) = \frac{1}{A_{ij}} \sum_{i=1}^n A_{ij} A_{ij}^{\text{compl}}$$

n ... the number of patches intersecting planning unit j
 A_{ij} ... the total area of planning unit j
 A_{ij}^{compl} ... the area of patch i inside of planning unit j
 A_{ij}^{compl} ... the complete area of patch i including the area outside the boundaries of planning unit j



* Office of Military Geography and Hydrometeorology in Dobruška; ** The Czech Office for Surveying, Mapping and Cadastre; *** Road and Motorway Directorate of the Czech Republic

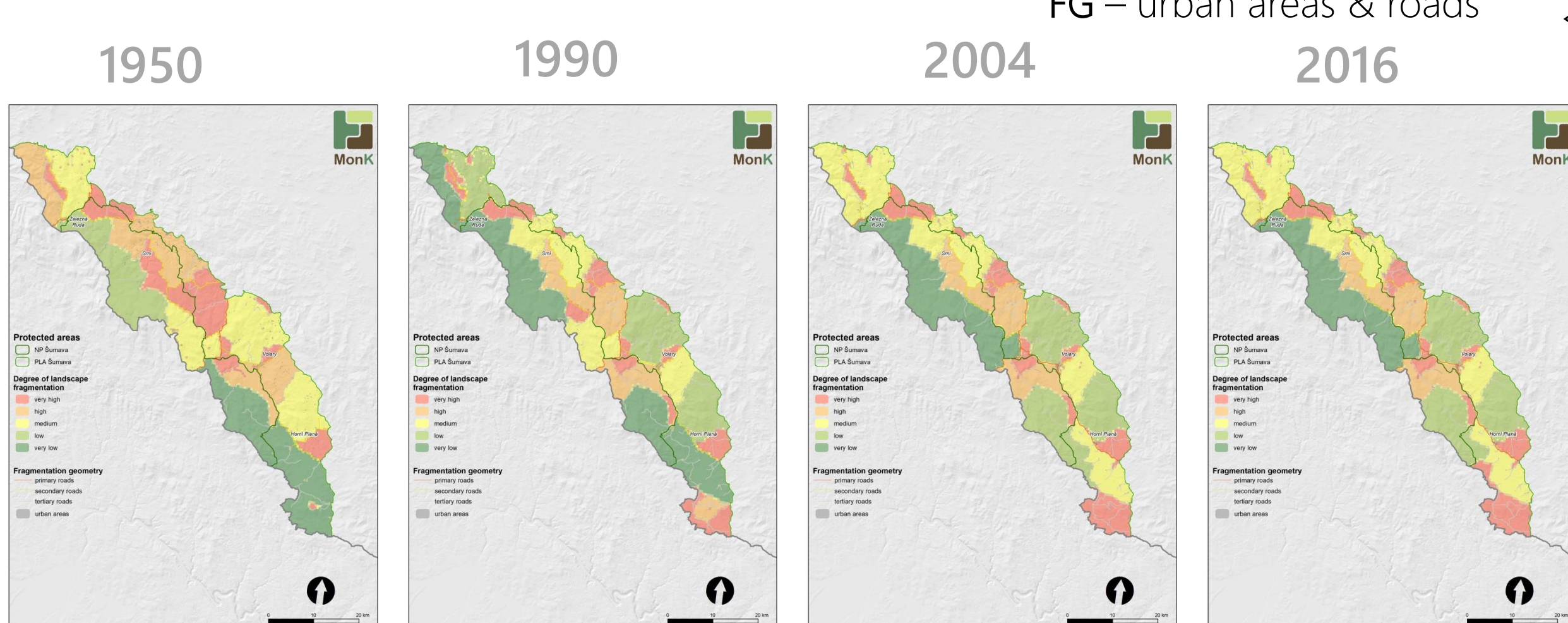
Boards of protected areas derived from Nature Conservation Agency of the Czech Republic

RESULTS

- The landscape fragmentation is calculated within regular network of squares 500x500 m
- The results should be use for conservation planning in protected areas

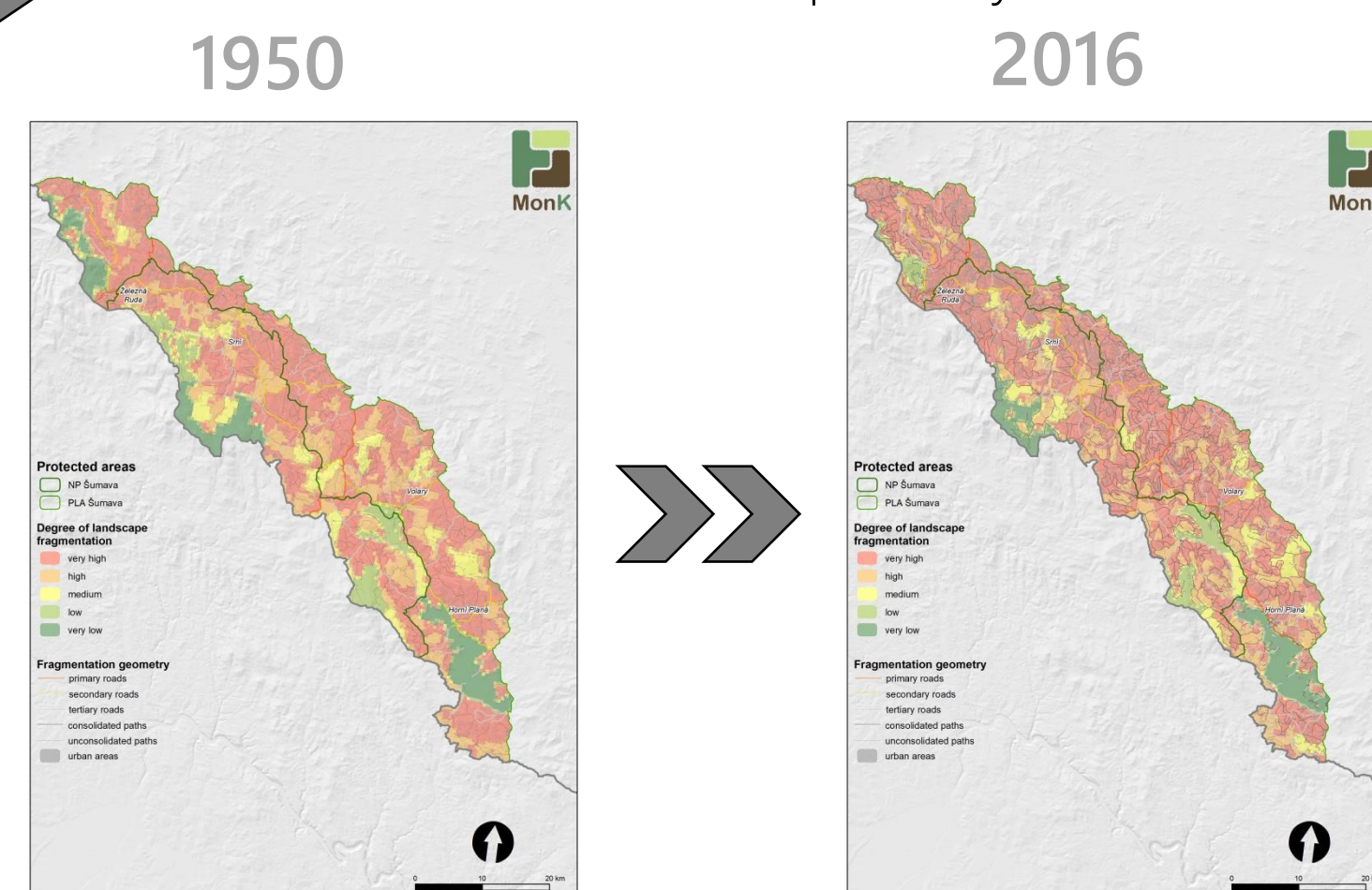
- Despite legal protection of model areas (NP, PLA & NATURA 2000 site), results show a relatively high degree of fragmentation by roads (especially pathways). However, the fragmentation by path network could have many positive impacts in homogenous segments of land cover.

NP a PLA ŠUMAVA

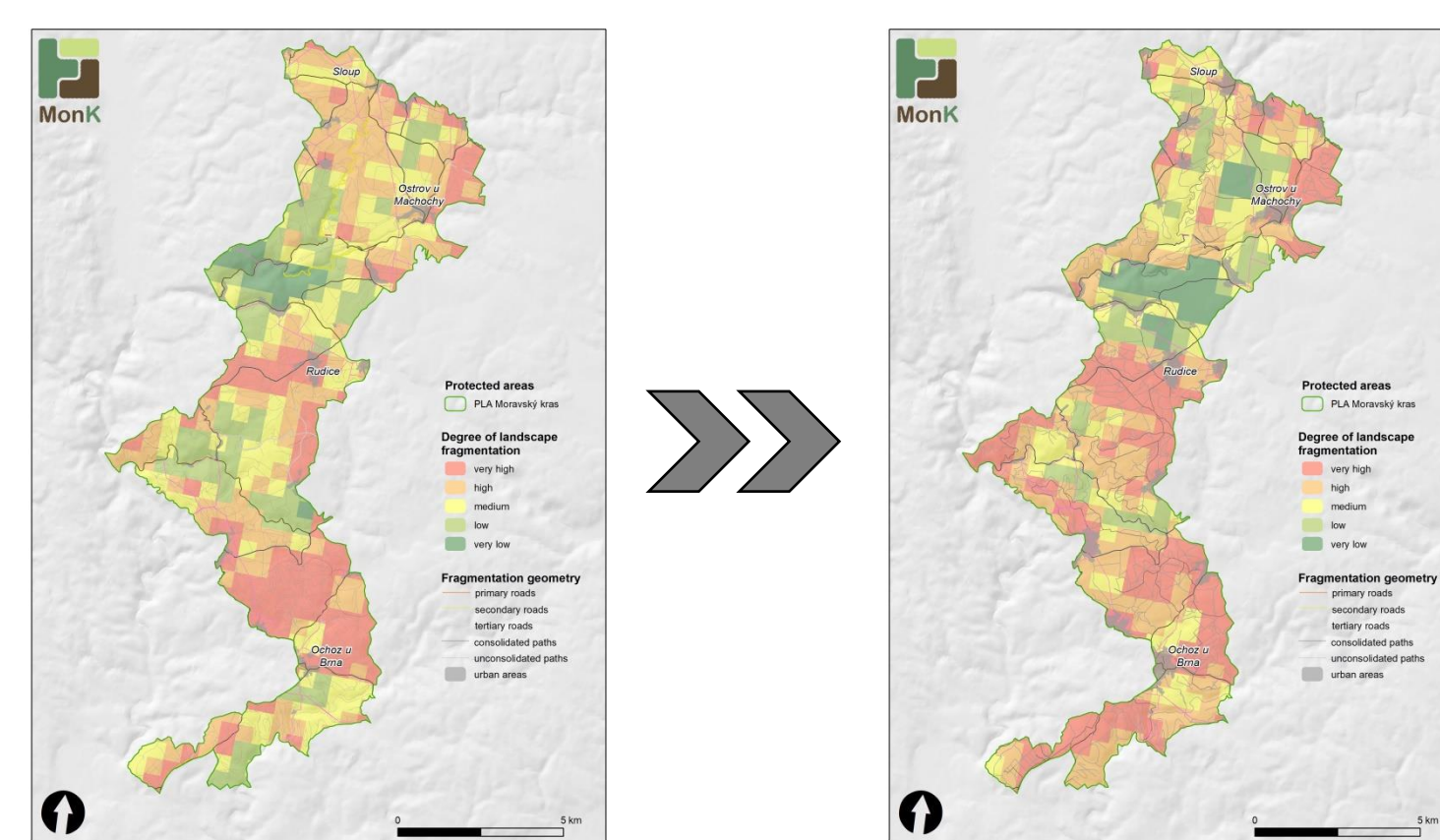
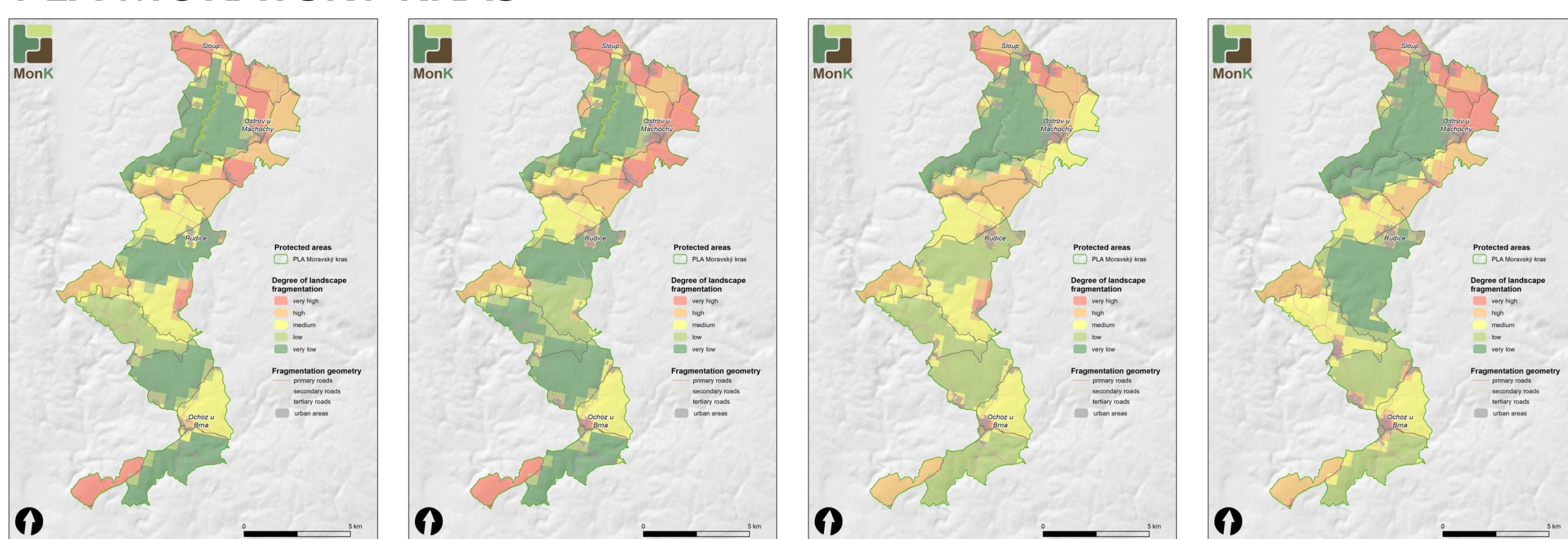


All figures and data was made by authors in ArcGIS v. 10.6

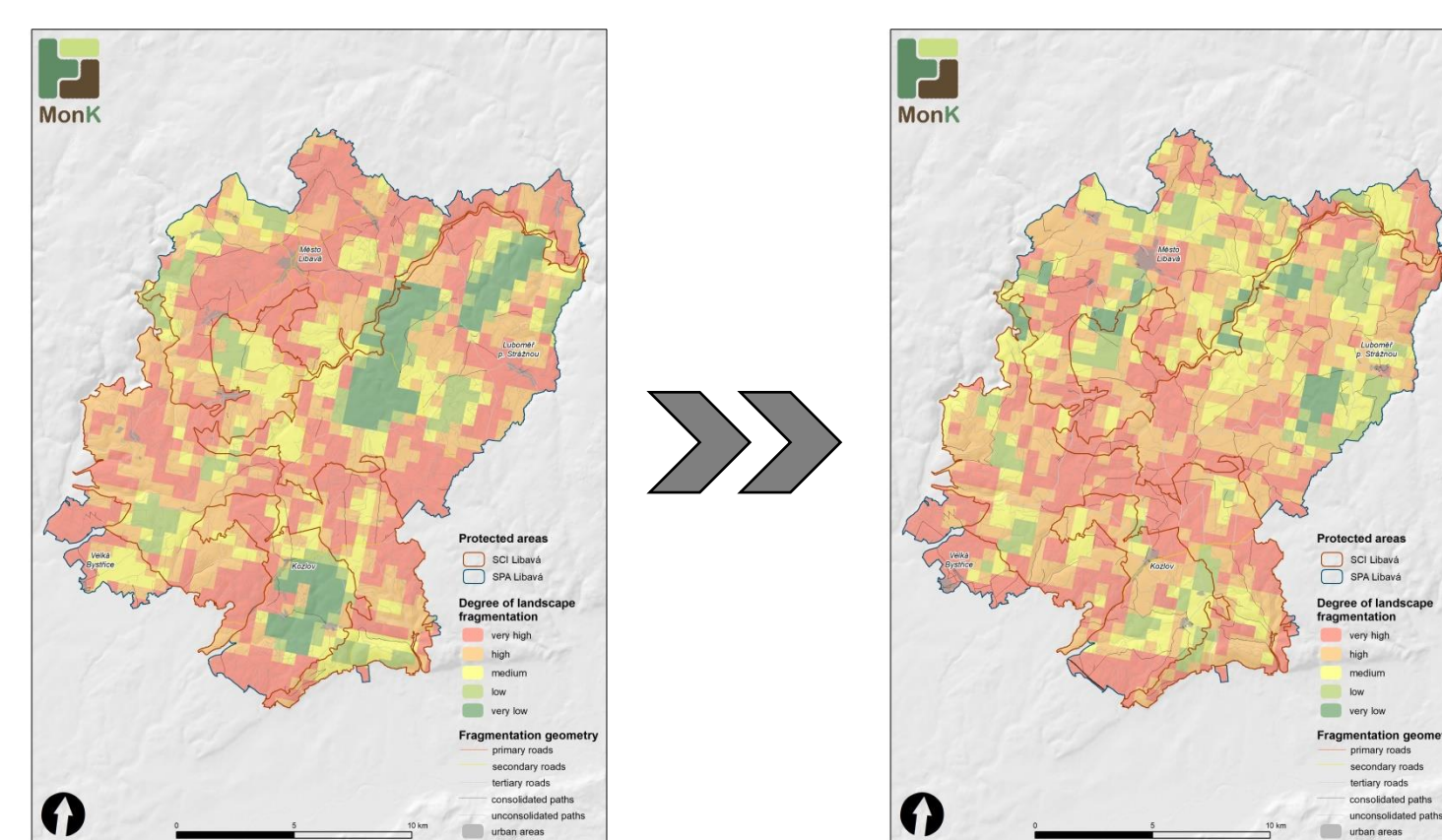
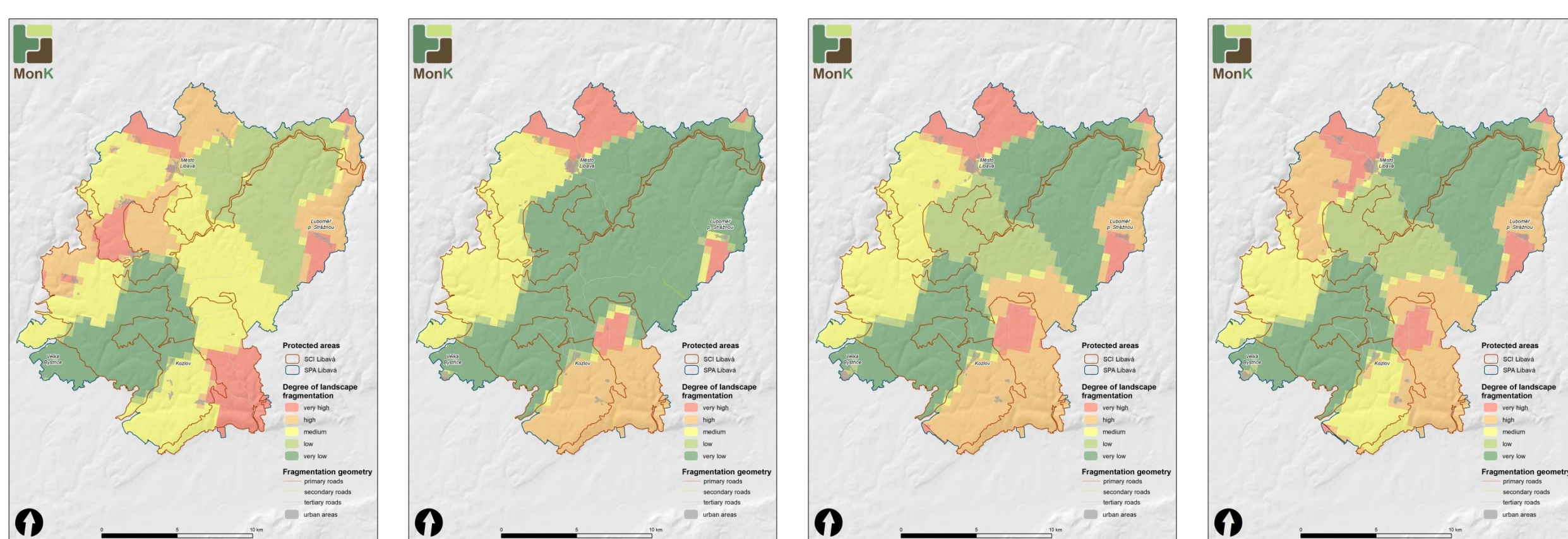
FG – urban areas, roads & pathways



PLA MORAVSKÝ KRAS



SCI a SPA LIBAVÁ



CONCLUSIONS & FUTURE RESEARCH IMPLICATIONS

- In 2019, two NP, and four PLA and six NATURA 2000 sites will be evaluated in the same way, all PA should be assessed within the project
- The results will be uploaded to website – www.monitoringkrajiny.cz, geoportal – <https://mapy.monitoringkrajiny.cz> & Facebook - [@SPECLabVUKOZ](https://www.facebook.com/SPECLabVUKOZ)

