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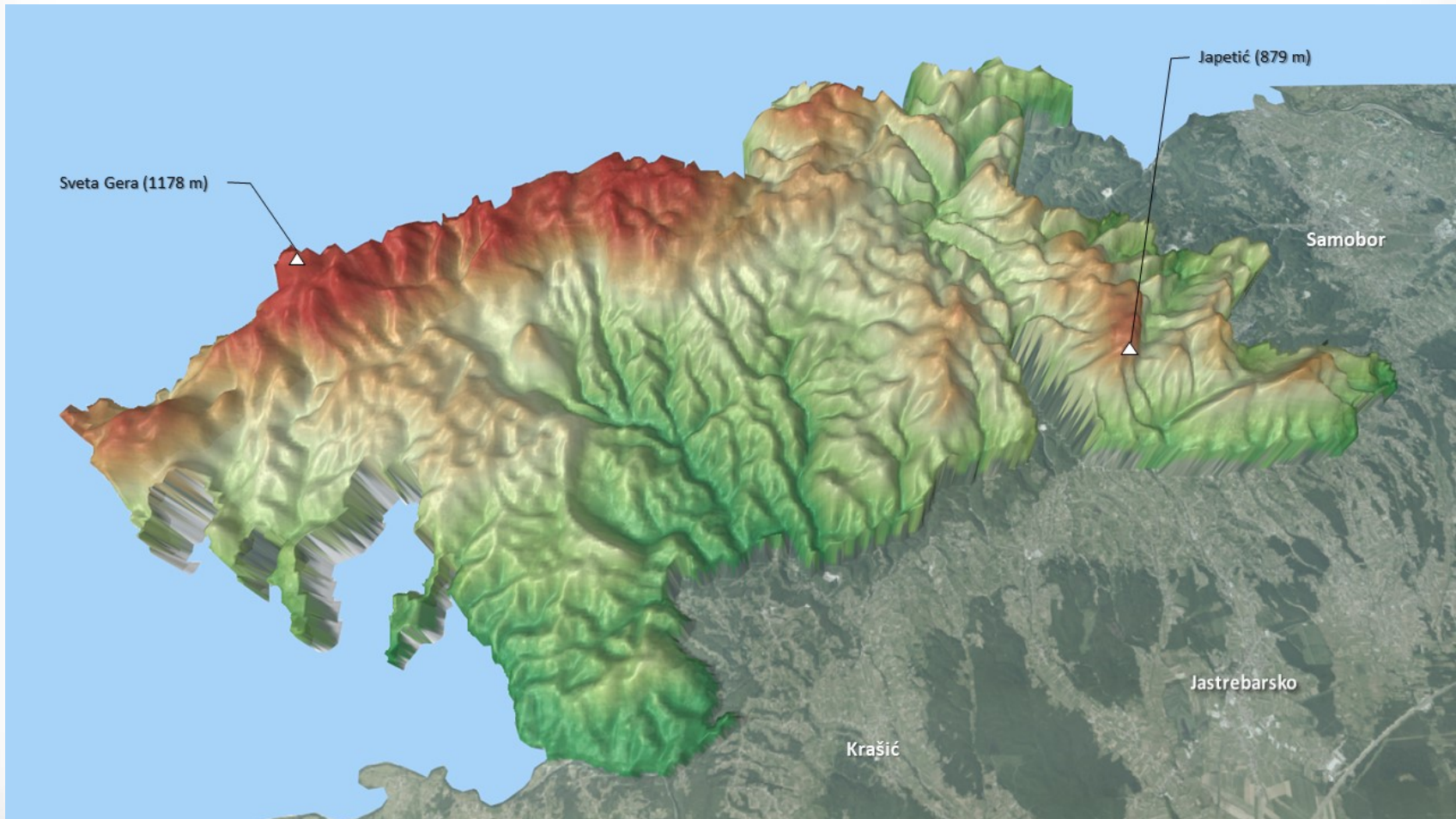
# **Challenges in grassland biodiversity conservation in protected area of Nature Park “Žumberak – Samoborsko gorje“, Croatia**

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# About the area

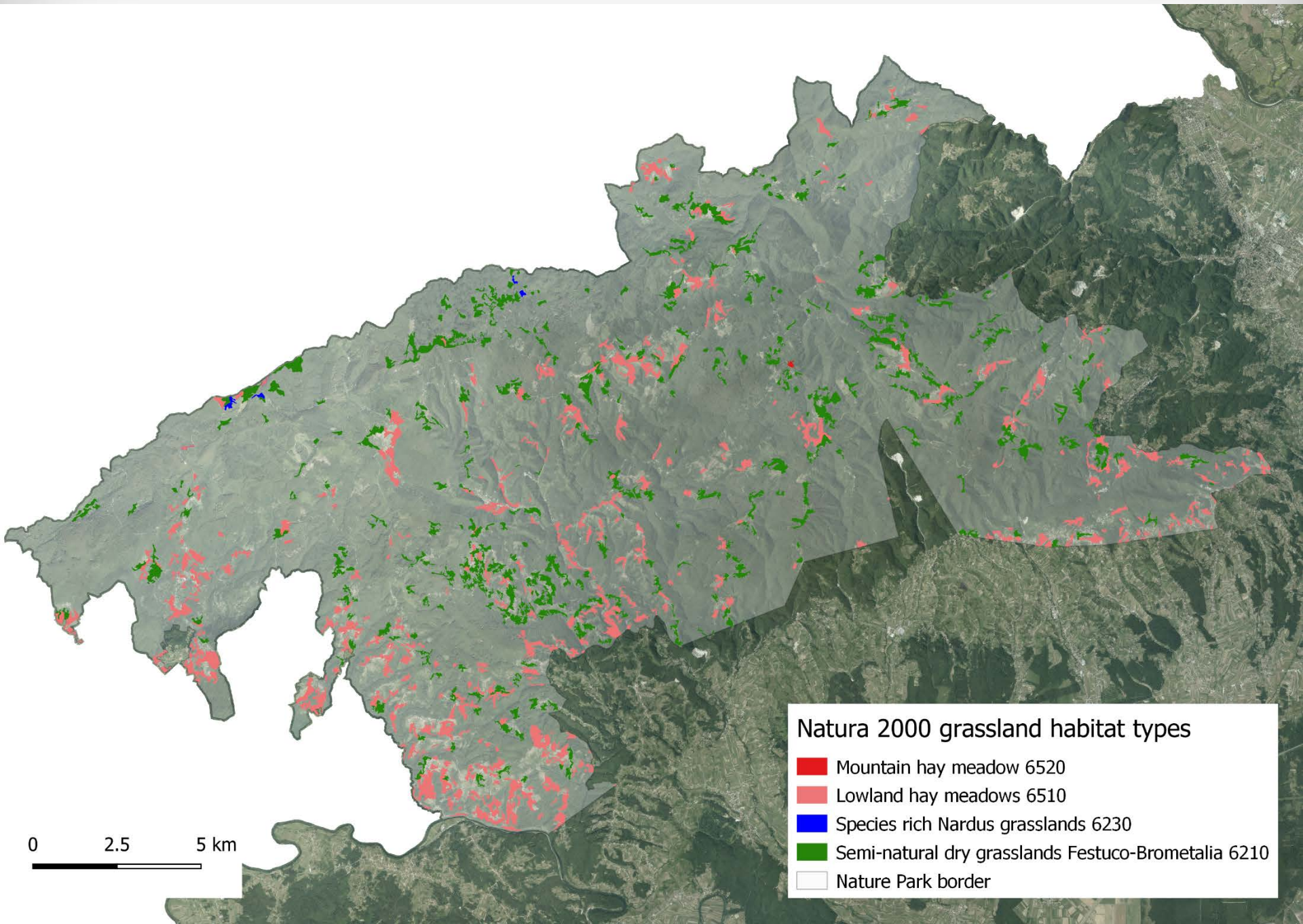


# Grasslands in the Nature Park



- 60% of the Nature Park area is covered in forests (20 430 ha)
- Non-forest areas cover approximately 12 510 ha or 36,5% with 21% being arable field, 4% orchards, 5% vineyards, 37 % meadows and 33% pastures
- Most of the grasslands within Nature Park are also Natura 2000 habitat types
- 4 / 14 Natura 2000 habitat types are grasslands:
  - 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
  - 6520 Mountain hay meadows
  - 6210\* Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)
  - 6230\* Species rich *Nardus* grasslands on siliceous substrates in mountain areas (and submountain areas in Continental Europe)





### Natura 2000 grassland habitat types

- Mountain hay meadow 6520
- Lowland hay meadows 6510
- Species rich Nardus grasslands 6230
- Semi-natural dry grasslands Festuco-Brometalia 6210
- Nature Park border

# Traditional management of grasslands

- The semi-natural grasslands in the Park can be divided into a number of different types depending on their management
  - Hay meadows
  - Pastures
  - Hay meadows which are also grazed
  - Improved grasslands
  - Abandoned grasslands (no management)
- Hay meadows
  - The mowing regime largely determined by the altitude and their location
    - Cut once a year in August
    - Some are cut twice a year (first time in June or July, followed by a second cut in August or September)
    - Some hay meadows are only cut occasionally, for example Ječmište (800 – 900 m), which is only cut during dry years.
- Pastures
  - Grazed throughout the growing season, i.e. ‘from snow melt to snow fall’
  - Differentiated by the type of grazing livestock; horses, sheep, goats, cattle or combinations of sheep and cattle, or sheep and goats
  - The type of livestock has a great influence on the floristic composition and structure of the grassland

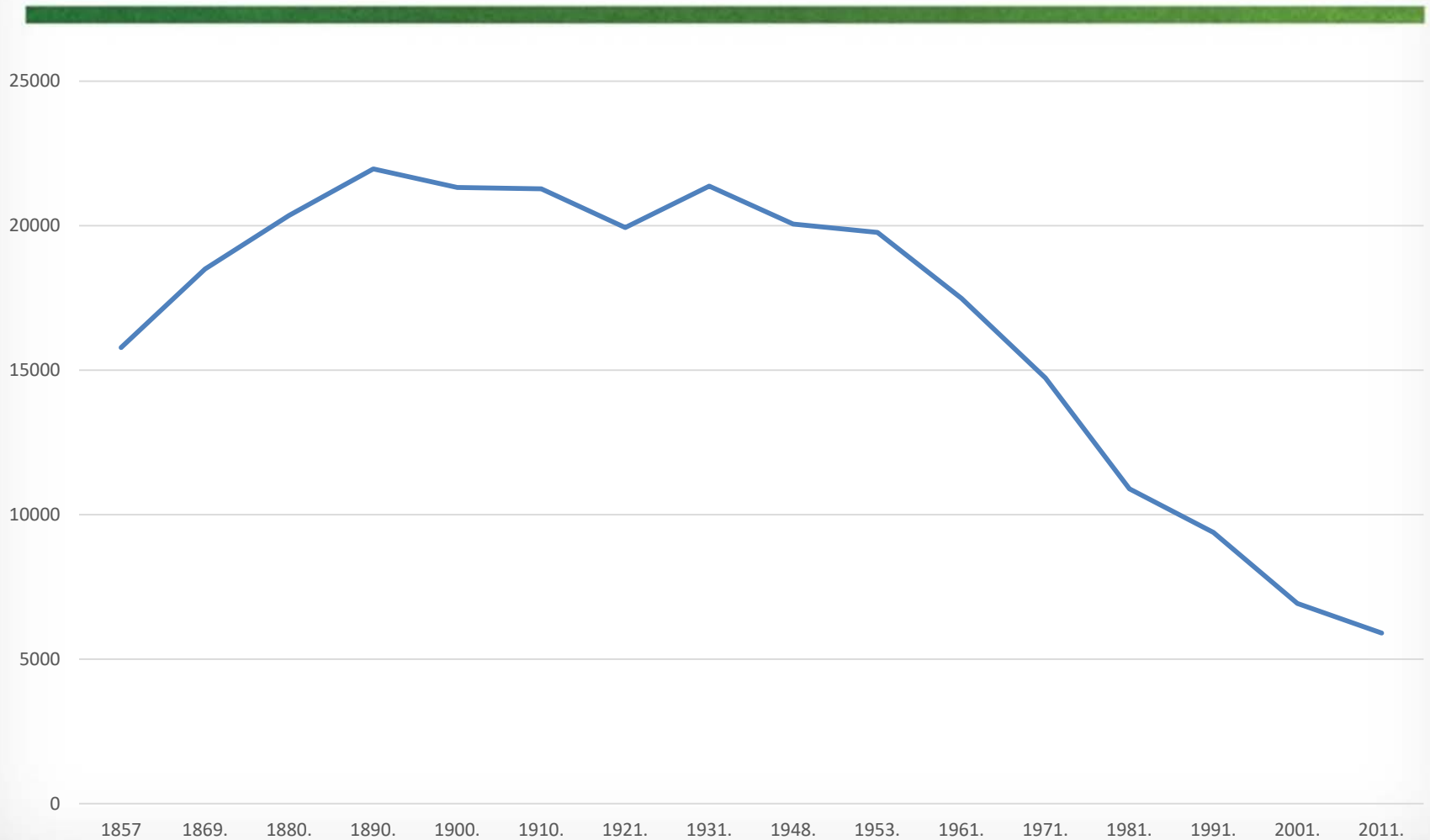
# Traditional management of grasslands

- The most common type of management on hay meadows, which are also grazed
  - grazed after the July hay cut (aftermath grazing). In addition, livestock can also be put out to pasture from early spring to Saint George's day (23 April). This is followed by a cut in August, with aftermath grazing until snow fall
- A small number of grasslands in the Park have been agriculturally improved using grass/legume seed mixtures composed of around five species, notably *Trifolium repens*, *Trifolium pratense*, *Medicago falcata*, *Lolium perenne* and *Festuca sp.* It is not known whether artificial fertilizer is also applied to these grasslands
- Abandoned grasslands - grasslands natural succession towards woodland communities occurs
- Mesophilic grasslands around the villages are part of a dynamic arable-fallow-grassland system. These alternating land use practices help to create and maintain a biodiversity rich mosaic of different habitats, in different stages of succession. For example, an orchid rich field observed in Budinjak in 2006 was an arable field 15-20 years ago.

# Why effort to conserve grasslands?

- Key to conserving the Park's mosaic landscape
- Natura 2000 network
- Grasslands support a range of plant and animal species, essential to the conservation of biological diversity at both a local and European level
  - Habitats to critically endangered black anemone *Pulsatilla pratensis* (L.) Miller ssp. *nigricans* (Störck) Zam.
  - Over 38 orchid species
  - 38 bird species recorded in the Park which are least partially or fully reliant on grassland habitats (Dumbović Ružić & Ščetarić Legan 2003)
  - Habitat for vulnerable mountain blue alcon butterfly *Phengaris alcon rebeli* (Hirscke, 1904)
  - The grassland-scrub ecotone or zone is a very important habitat for the Natura 2000 target orchid *Himantoglossum adriaticum* H. Baumann
- Grasslands are essential for hunting, sport and recreation, tourism and education

# Challenges in grassland conservation: continuous depopulation



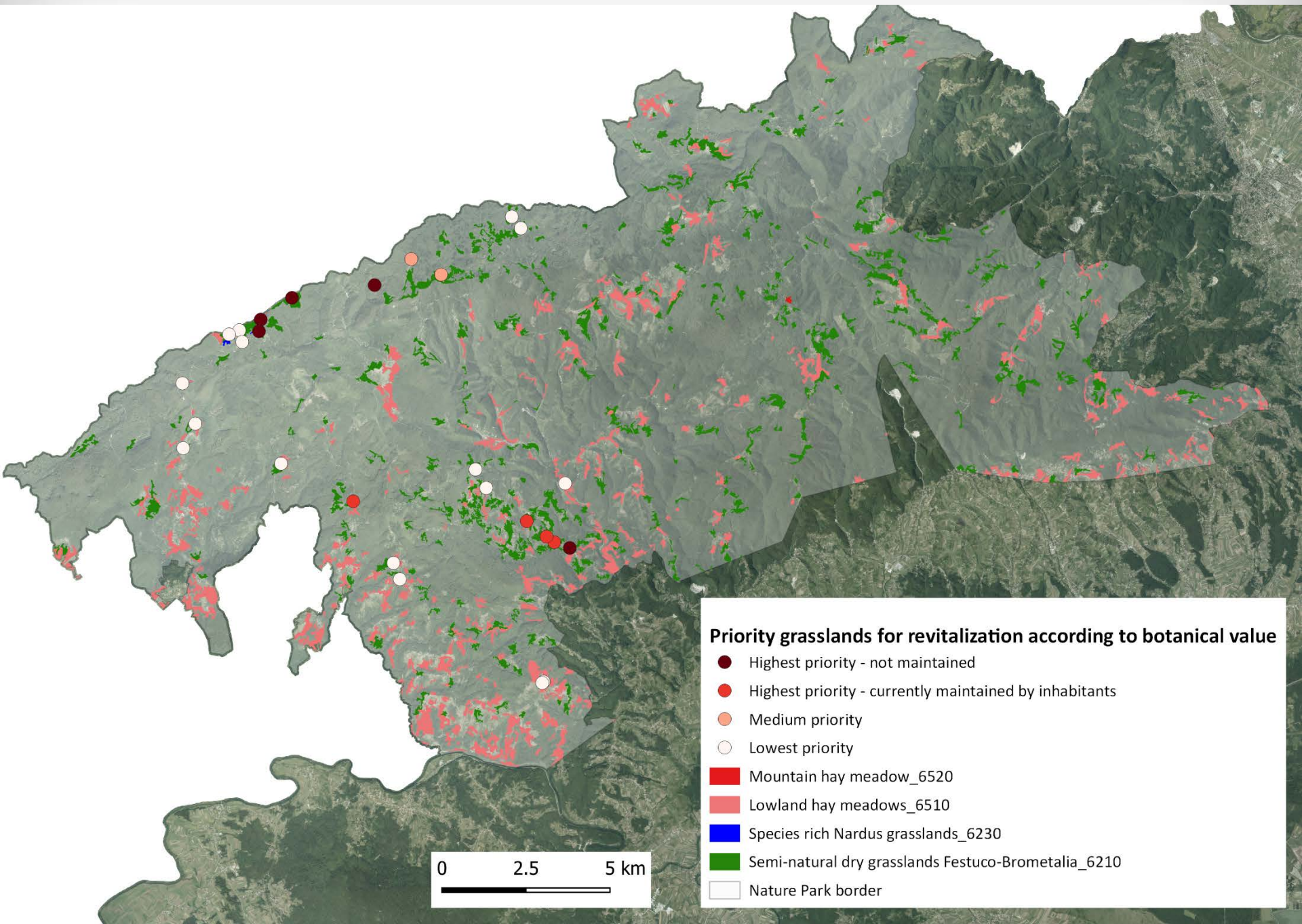


# Challenges in grassland conservation

- Continuous depopulation and increasing age of the local population
- Abandoning the rural way of life and emigration
- Succession of grassland communities to forest
- The intensification of agriculture close to settlements
- Agricultural politics
  - Poor economic returns for small scale agricultural producers
  - Insufficient government and local programmes for rural and border regions which would lead to an improvement in the standard of living in the region
  - Lack of government subsidies
- Inadequate or poor infrastructure
- The low number of visitors to the area is currently insufficient to promote the production of local products on a commercial scale
- The small number staff currently employed in the Nature Park administration
- Inadequate financial resources for the Nature Park administration's activities

# Steps undertaken so far

- **„Developing a model for the conservation of Croatia’s grassland biodiversity”, 2004 -2007**
  - Project was co-financed by Darwin Initiative, Great Britain.
  - Project partners: PI Žumberak – Samoborsko gorje, FFI (Fauna & Flora International), IGER (Institute of Grassland and Environmental Research), Darwin Initiative
  - Handbook „Biodiversity and overview of present grassland habitat condition” (Eastwood, A., Tallwin, J.R.& Gundry, A. (2006.) Biološka raznolikost i pregled stanja travnjaka – priručnik, Fauna&Flora International, Cambridge, UK.)
  - **Grassland Action Plan for the Žumberak-Samoborsko gorje Nature Park, March 2007**
- **„High Trunk Meadow Orchards as a Preservation Element of Biotic Diversity and Aesthetic Value of the Landscape”, 2006-2007**
  - The project was co-financed by EU (INTERREG IIIA, Neighbors’ program Slovenia – Hungary – Croatia 2004-2006)
  - Project partners: PI Žumberak – Samoborsko gorje, Croatian institute for agricultural consulting, Kmetijsko gozdarska zbornica Slovenije, Public institute Kozjan park, Zavod Republike Slovenije za varstvo narave (OE Novo Mesto)
- **Research of grasslands’ plant communities of western part of Nature Park Žumberak – Samoborsko gorje with proposed measures for revitalization and conservation, 2015**
- **Inventorization of grasslands flora in Oštrc area in Nature Park Žumberak – Samoborsko gorje, 2017**
- **Public Institution Management Plan for period 2017 – 2026**
- **ECO KARST, Interreg Danube Transnational Programme, 2017 - 2019**





# Steps undertaken so far

## Manual mowing event

- Yearly since 2013
- Promotion of traditional lifestyle
- Raising awareness of natural values and cultural heritage importance
- From 2017 cross-border cooperation on promotion of grasslands management with LIFE TO GRASSLANDS project



# How Public Institution manages grasslands today



**ŽUMBERAK  
SAMOBORSKO  
GORJE**  
Park prirode  
Nature Park

- Public Institution's annual budget for 2018 (from state budget) = approx. 462 000 eur
  - Administrative costs (salaries, transportation, utilities) = approx. 260 000 eur
  - From the remaining amount for the nature protection = approx. 50 000 eur, from that approx. 19.300,00 eur for the grasslands management
  - Additionally 5300 eur from cities and municipalities for grassland management
- 64 ha of grasslands mowed and mulched in 2018 / according to newest national habitat map (grasslands in Nature Park encompass approx. 3400 ha)
- Costs: fuel, mechanization maintenance costs, manpower – seasonal workers
- How we decide what we mow?
  - Priority grasslands determined by botanists
  - Cooperation with stakeholders – many contact Public Institution and ask help with grassland maintenance
  - With respect to administrative boundaries of city or municipality financing mowing costs



# Example of grassland management in the field





**Thank you for your attention!**







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