The role of historical monuments in nature conservation - Ancient burial mounds as refugees for steppe vegetation in agricultural landscapes of Eurasia

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Dry grasslands of Eurasia

- Outstanding conservational importance
- High biodiversity, numerous endemic species
- Special habitat conditions and heterogeneity, continuous extensive management
- The most extent dry grasslands are located in the steppe and forest steppe biom (~13 million km$^2$)
- In Hungary: loess, alkali and sand grasslands

Dengler et al. 2014 *Agriculture Ecosystems and Environment*
Land use changes

- Agricultural intensification, urbanisation
- Drastic losses in grassland area
  - Eurasian steppes: 57% decrease (~6 million km$^2$)
  - Ukrainian steppes: 92-95% ploughed
  - Hungary: 90% loss in loess grasslands (~170 thousand km$^2$)
- Steppe are habitats restricted to habitat islands

Wesche et al. 2016 *Biodiversity and Conservation*  
Molnár et al. 2012 in *Eurasian Steppes* (könyvfejezet)
Habitat islands and conservation

• Huge proportion of natural and semi-natural habitats are situated out of the protected areas
• Role of habitat islands in transformed landscapes
  • Act as refugia
  • Connecting metapopulations
  • Sustain landscape scale species diversity

Lindborg et al. 2014 Biological Conservation
Types of habitat islands

• Areas inadequate for agricultural production
  • Road verges, field margins, riverbanks, rocky outcrops

• Sacred natural sites
  • Kurgans, ancient earthen fortresses, cemeteries, churchyards, saint mountains and sacred grooves

Dudley et al. 2009 Conservation Biology
Molnár V. et al. 2018 Tuexenia
Debrecen, verge of the highway 33.
Tula, Russia, riverbanks
Tápióság, Sarmatian earthen fortress
Kurgans

- Burial mounds of the steppe and forest steppe biom
- Built in the Eneolithics (3500-2800 BC)
- Built from topsoil
- Height 0.5-15 m, area 0.01-1 ha
- 400-600 000 kurgans in Eurasia
- Sacral places, historical artefacts, folkloristic and cultural importance
Land use types

• Originally covered by grasslands
• Present days: arable lands, forest plantations, urban area
• Still many kurgans are covered by grasslands
• Gradient from the lowlands to the highlands
• Gradient from east to the west
  • Hungary 7% (Tóth 2006)
  • Ukraine 23% (Sudnik-Wójcikowska et al. 2011)
  • Kazakhstan, predominantly covered by grasslands