

Bat colonies in man-made underground sites of Romania: conservation and challenges



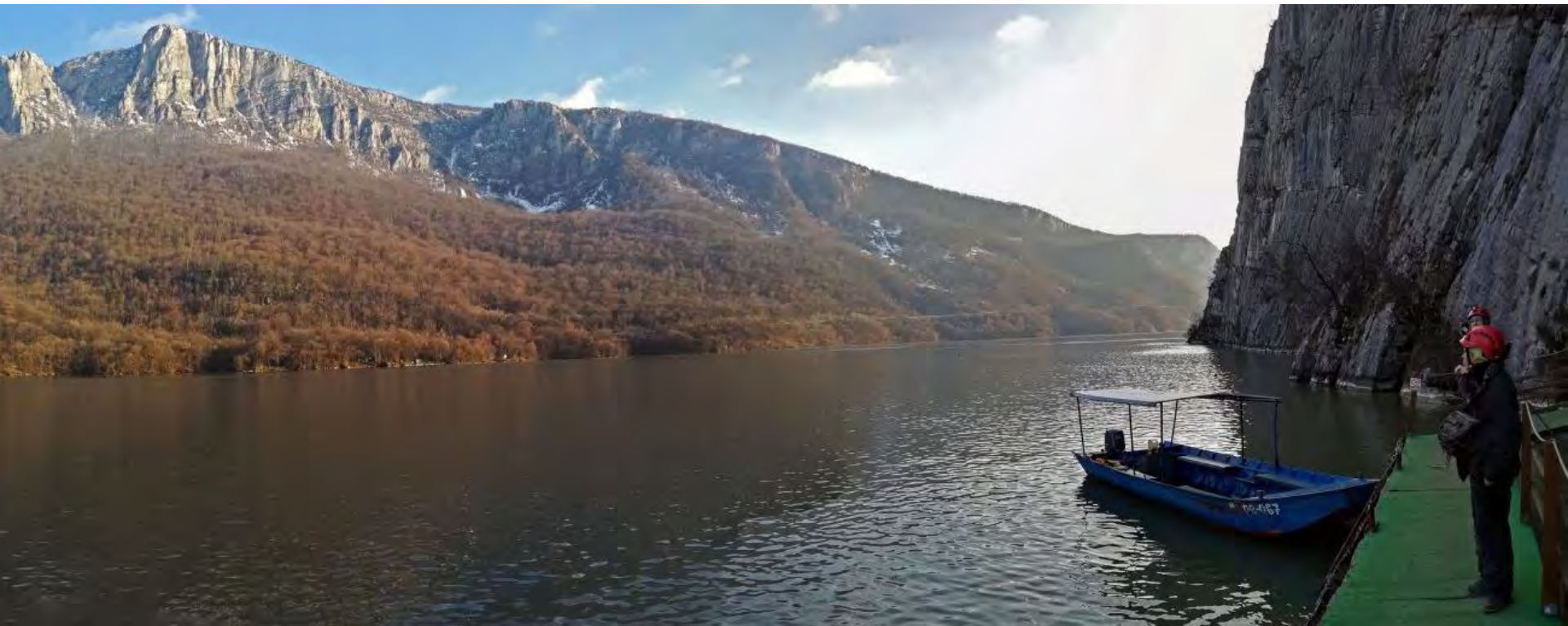
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International Bat Conference: Protection of bat populations - threats, problems, practices, solutions
2021.10.26-28

The Romanian landscape

- 12.000+ caves in vast karstic areas
- hundreds of historical buildings
- largest remnants of virgin forests in the EU



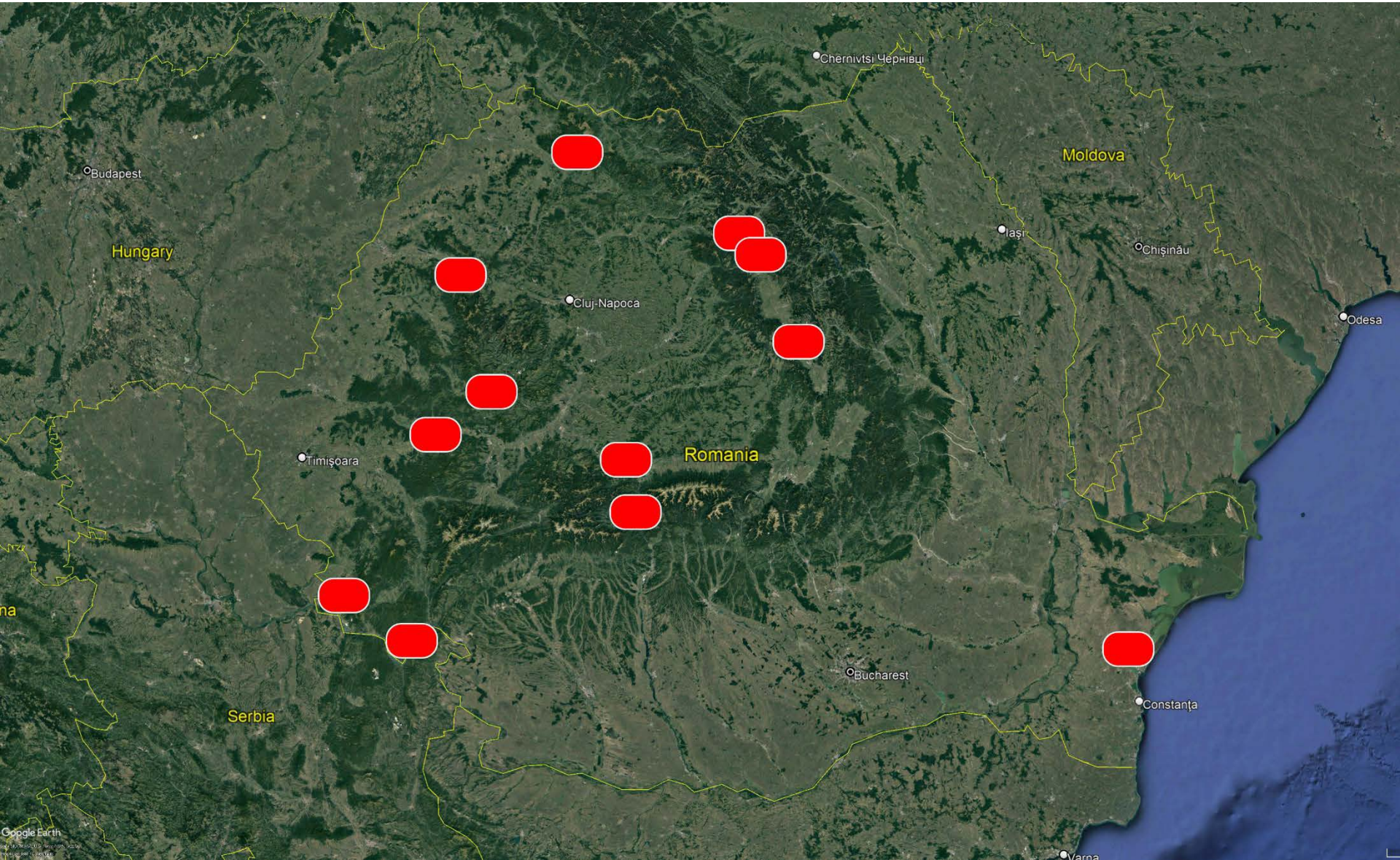


Colonies of 1.000+ bats are usual

- several colonies of 10.000+ bats
- two sites with 40.000+ bats



Extensive mining areas



Hundreds of km of mine galleries



Roman era mines, crypts, cellars



Former bunkers, tunnels, deposits



2010-2021, several projects

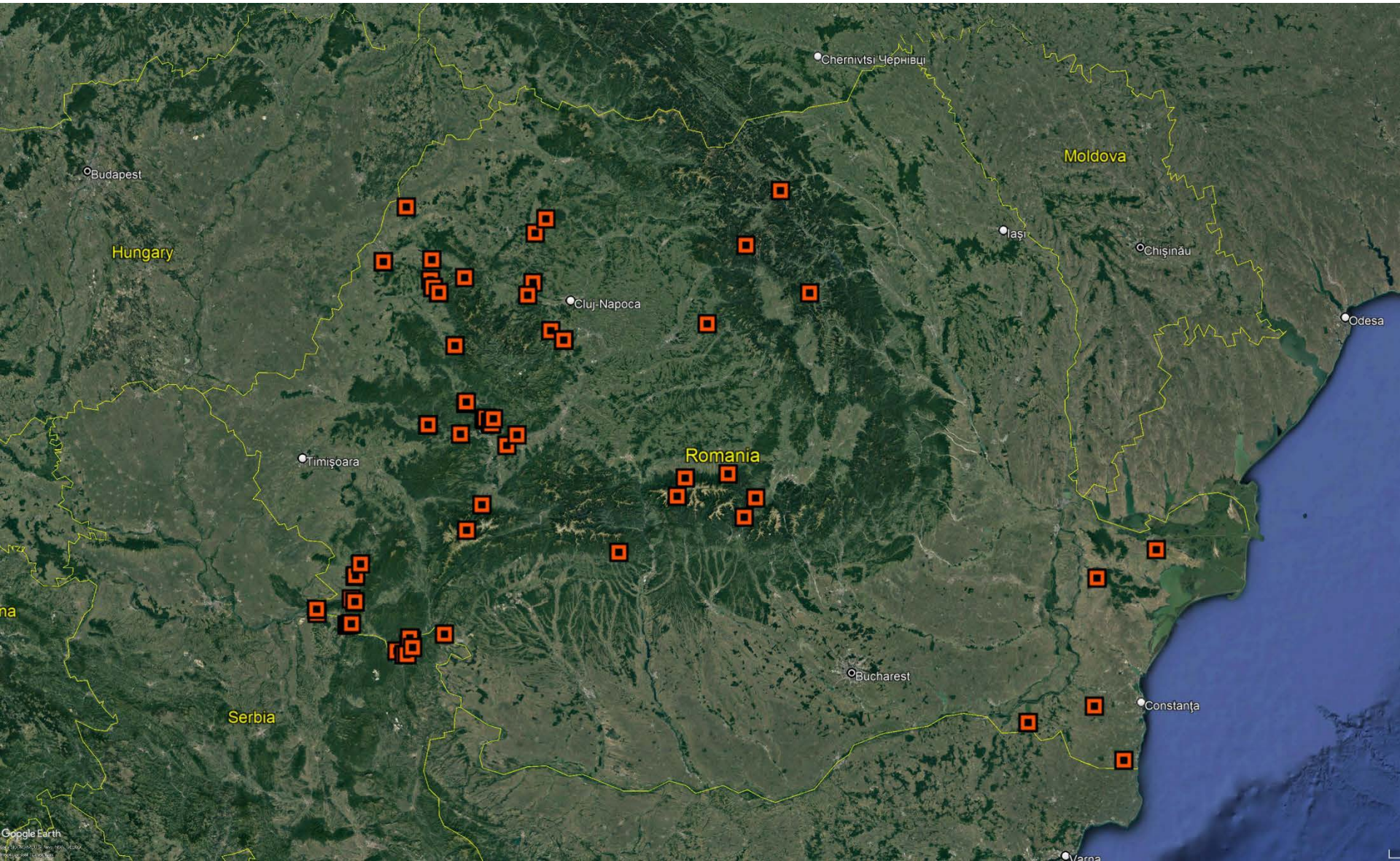


Basic bat research methods

- direct / visual observations
- mist-netting
- ultrasound records

- winter / hibernation
- summer / nursery
- spring & autumn / migration
- autumn / swarming

81 man-made underground roosts



25 out of the 32 Romanian species

- all five *Rhinolophus* species
- *M. myotis* / *blythii*



25 out of the 32 Romanian species

- exclusive cave-dwellers, ex. *M. schreibersii*
- trawling bats, incl. *M. dasycneme*, *M. capaccinii*



25 out of the 32 Romanian species

- woodland species: *B. barbastellus*, *M. bechsteinii*
- *E. nilssonii*, *Plecotus* species



All colony types present

- hibernation / nursery



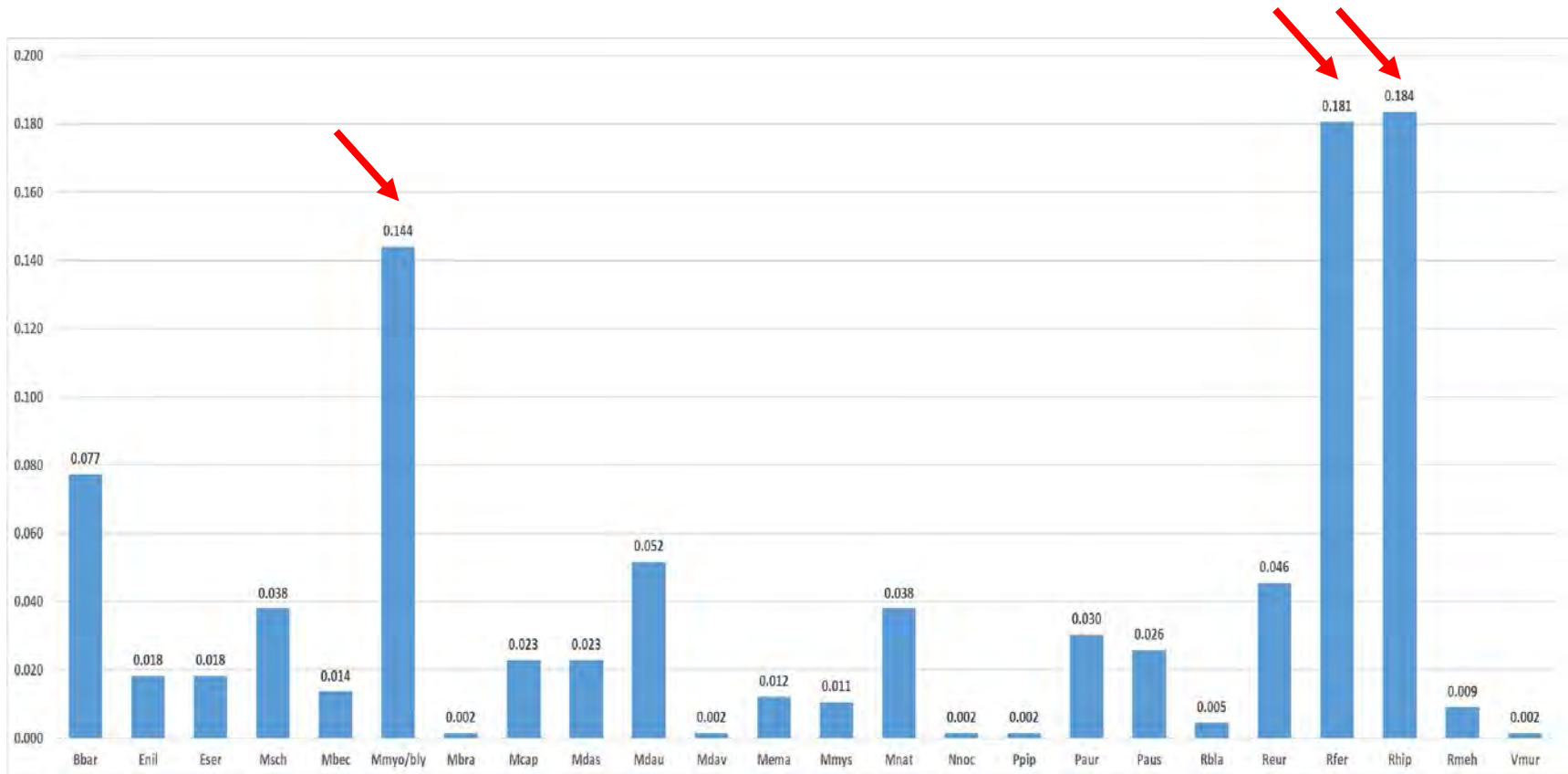
All colony types present

- transitory: *R. ferrumequinum*, *M. schreibersii*
- swarming



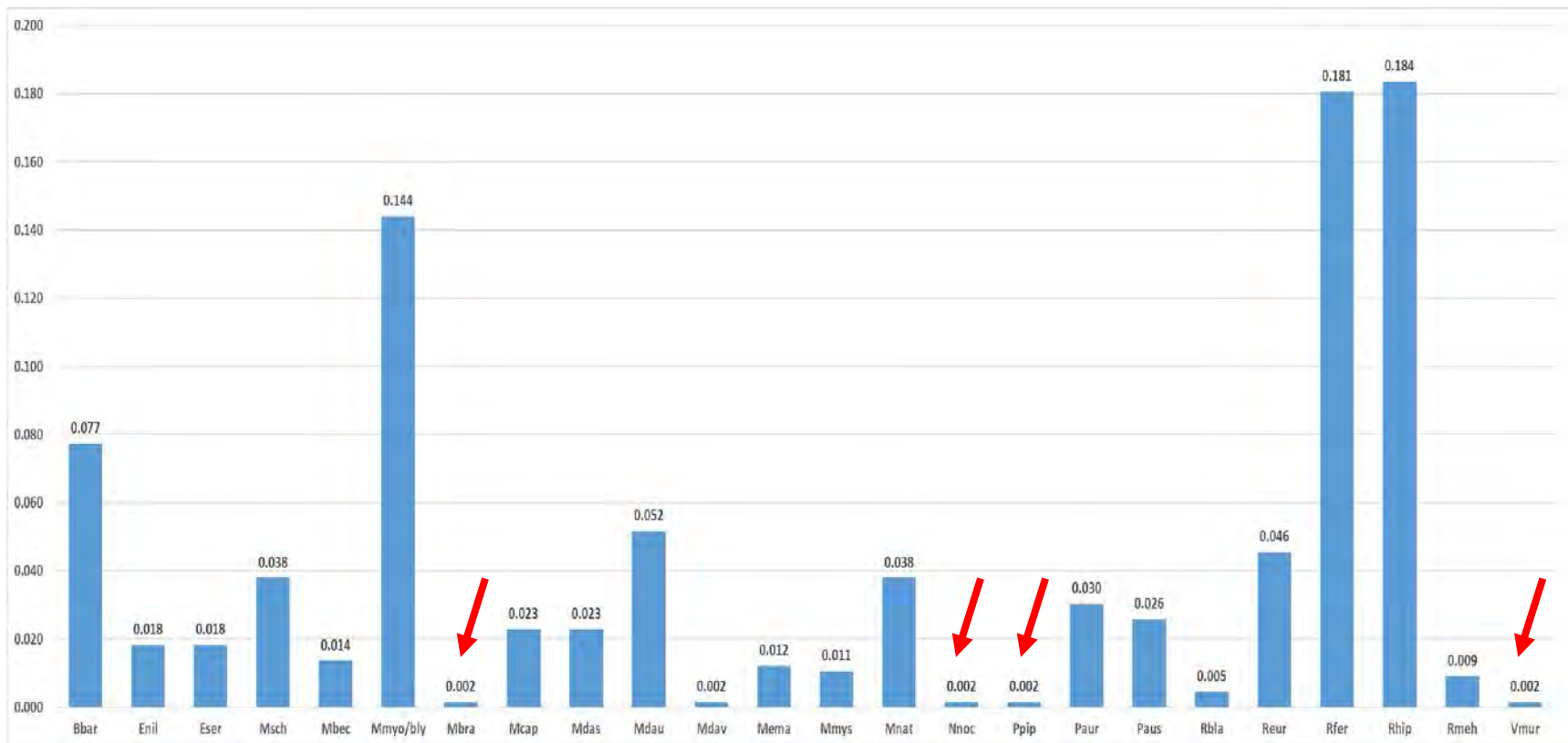
Most frequent species

- *R. ferrumequinum*, *R. hipposideros*, *M. myotis* / *blythii*



Least frequent species

- *M. brandtii*, *N. noctula*, *P. pipistrellus*, *V. murinus*



Most diverse locations

- complex mine galleries
- 7 locations with 10+ species



Most diverse locations

- Albioara Mine system, NW Romania
- 15 species in hibernation



Most diverse locations

- Ponicova tunnel, SW Romania
- 12 species all year round
 - incl. *M. dasycneme*, *M. capaccinii*, *R. blasii*, *R. euryale*



Most diverse locations

- Piscul Negru mine, 1.200 m a.s.l., Făgăraș Mts.
- 10 species in hibernation / swarming
 - incl. 200+ *R. hipposideros*



Largest colonies

- Tunnel 1 at the Danube, SW Romania
- 800+ bats of 4 species in the nursery
 - *incl. M. capaccinii, M. schreibersii*



Largest colonies

- Tunnel 1 at the Danube, SW Romania
- 400+ bats of 6+ species in hibernation
 - incl. *R. ferrumequinum*, *R. euryale*



Largest colonies

- Sasca Montană mine, SW Romania
- 500+ bats of 4+ species in hibernation
 - incl. *R. ferrumequinum*



Largest colonies

- Arpaşului mine, Făgăraş Mts.
- 500+ *M. schreibersii* in the nursery



Largest colonies

- Oravița tunnel, SW Romania
- 600+ bats of 3 species in migration / hibernation
 - *R. euryale*, *R. ferrumequinum*, *M. schreibersii*



Largest colonies

- Tunnel 2 at the Danube, SW Romania
- 500+ bats of 3 species in migration
 - incl. *R. ferrumequinum*, *R. euryale*



Largest colonies

- Măliniș cellar, Făgăraș Mts.
- 100+ *R. hipposideros* in the nursery



Regionally important locations

- Farcu mine, NW Romania
 - 110+ *R. ferrumequinum*, 60+ *R. hipposideros* in hibernation



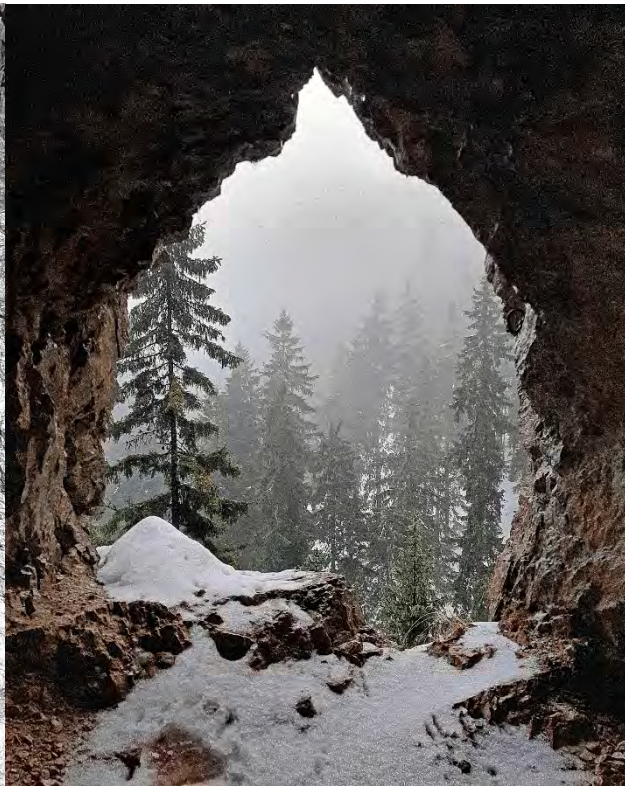
Regionally important locations

- Crypt of the Călugăreni Monastery
 - 40+ *R. hipposideros* in hibernation



Regionally important locations

- Rarău mine, 1.519 m a.s.l., N Romania
 - 35+ *B. barbastellus*, 15+ *E. nilssonii* in hibernation

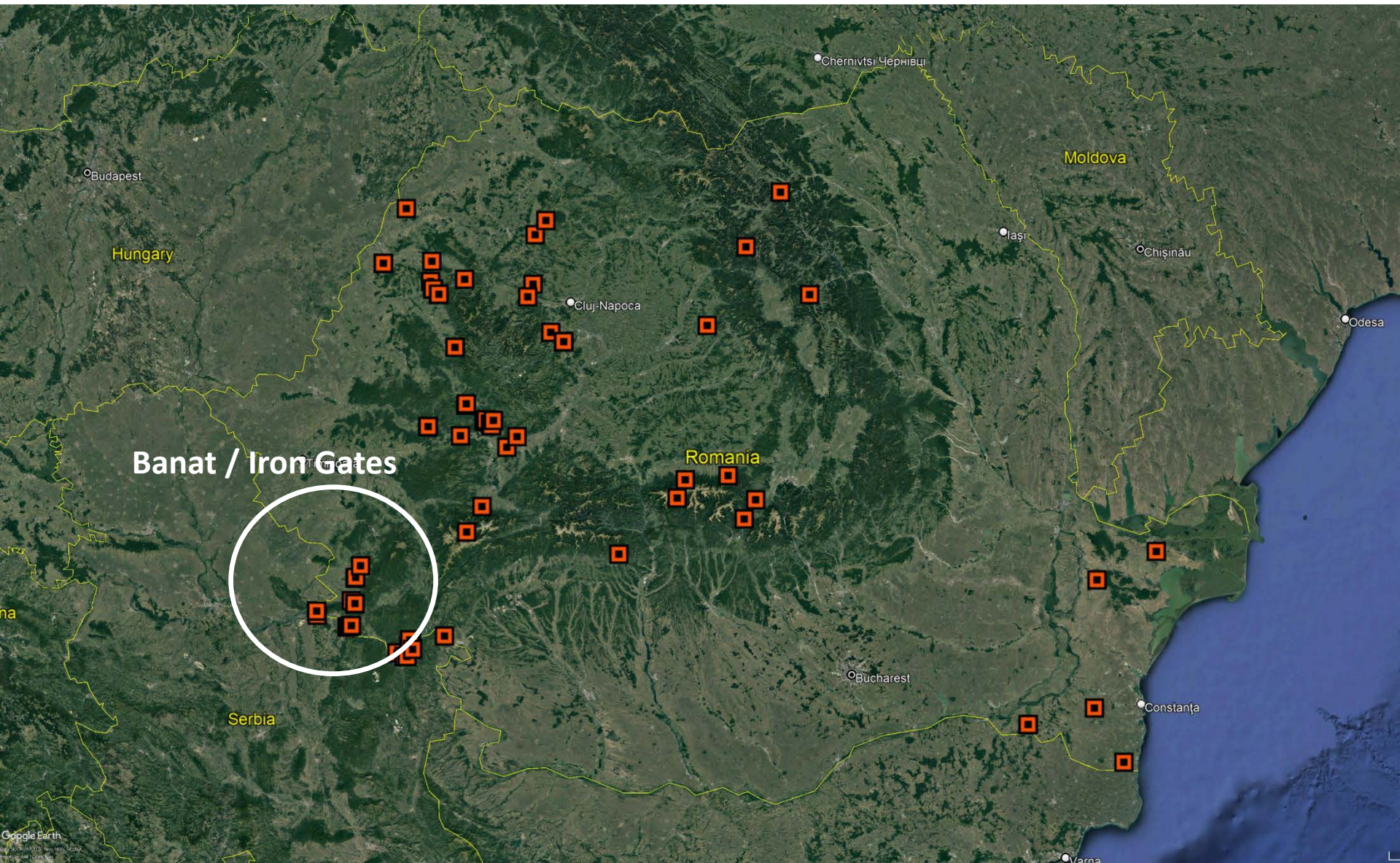


Regionally important locations

- Carol Fortified Line bunkers, NW Romania
- transitory *M. schreibersii* groups
 - transitory sites for the largest romanian nursery (6.000+ bats)



Cross-border migration (RO - SRB)



Cross-border migration



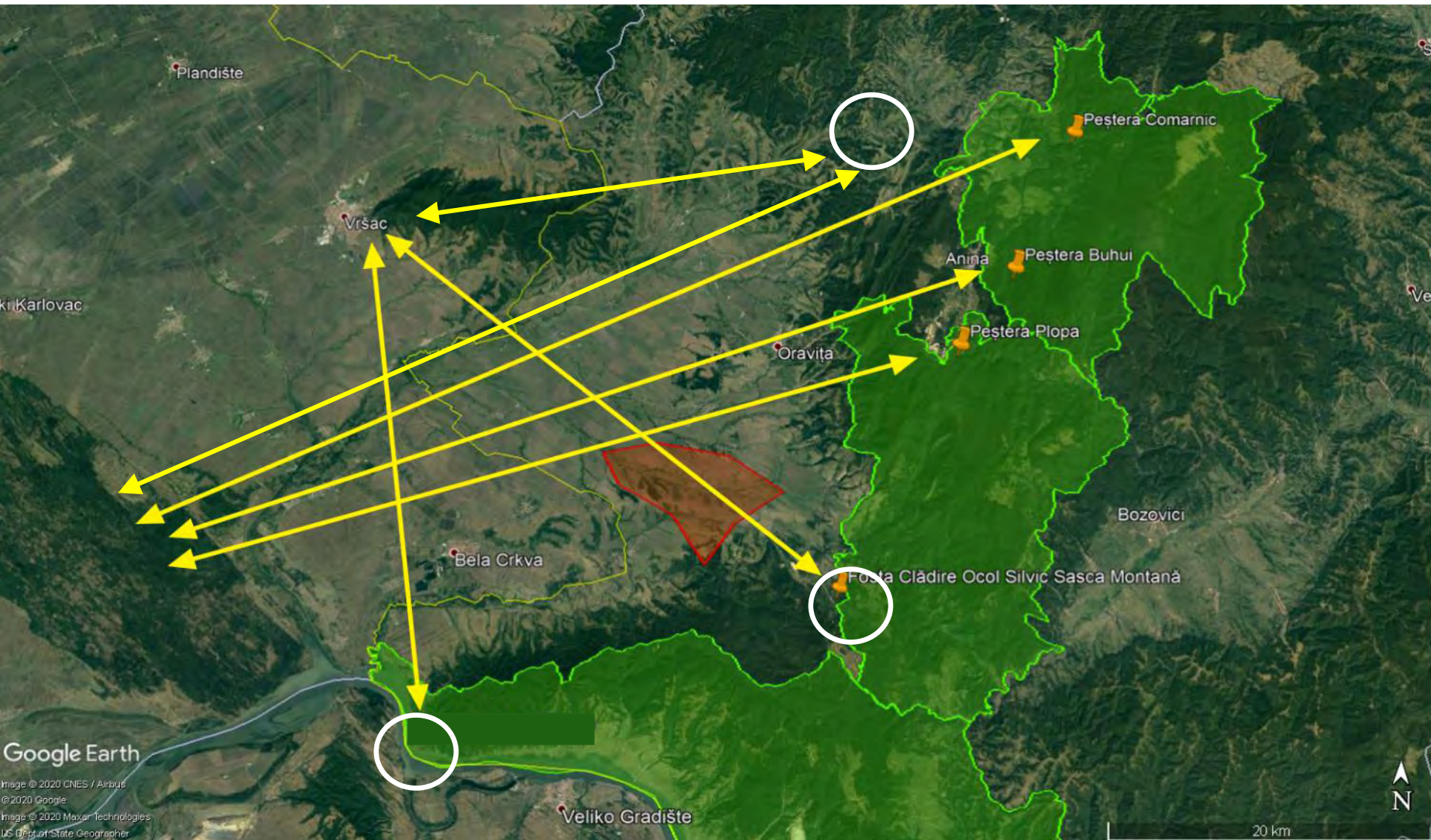
Cross-border migration (RO - SRB)

- connection between Romanian and Serbian colonies
- *R. ferrumequinum*, *M. schreibersii* ringed in Serbia



- hibernate in Romanian roosts (caves and mines)
- Sasca Montană mine
- Oravița tunnel
- Tunnel at the Danube

Cross-border migration (RO - SRB)



Cross-border migration (RO - SRB)

- joint, RO-SRB project



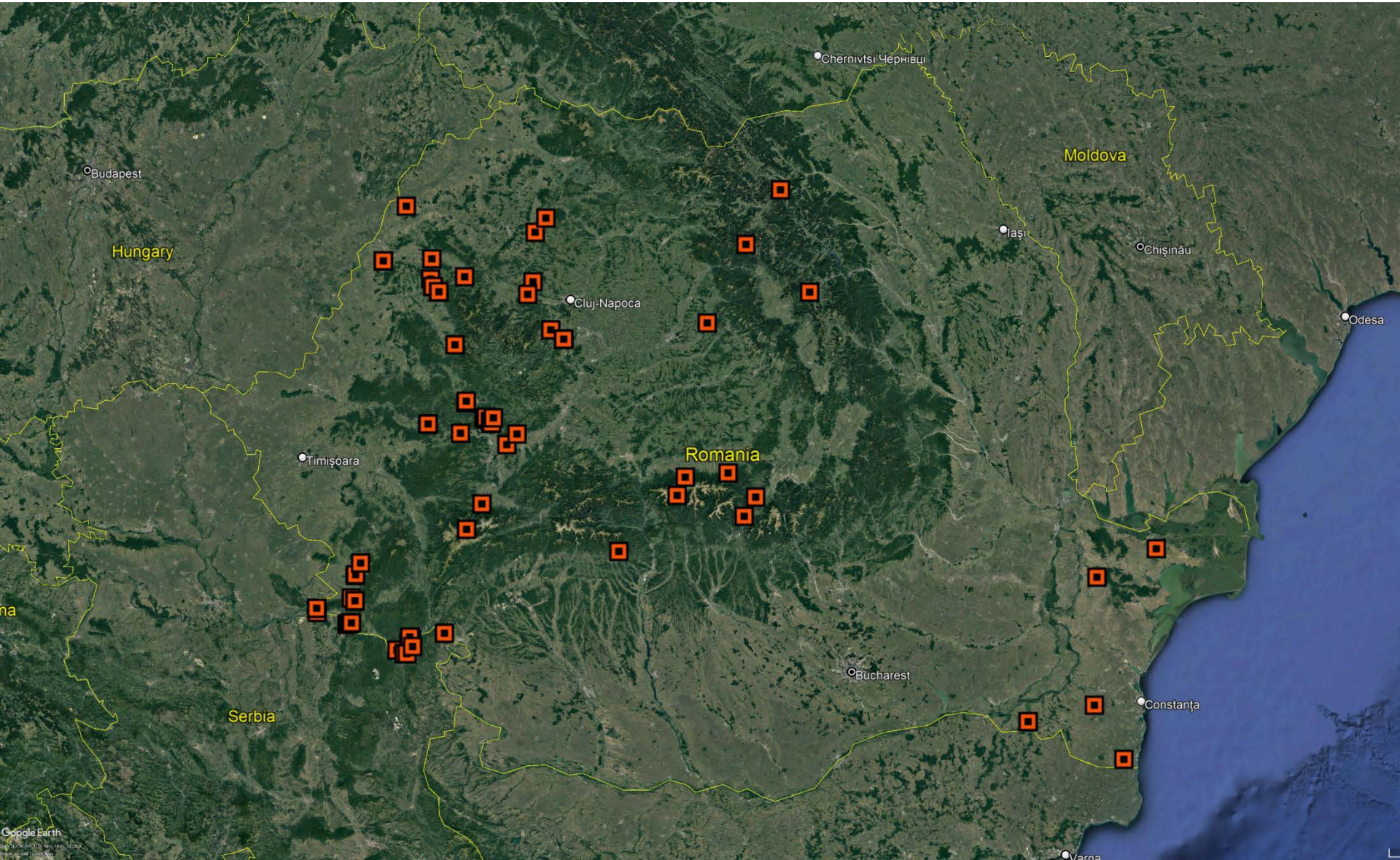
**CONSERVATION
LEADERSHIP
PROGRAMME**



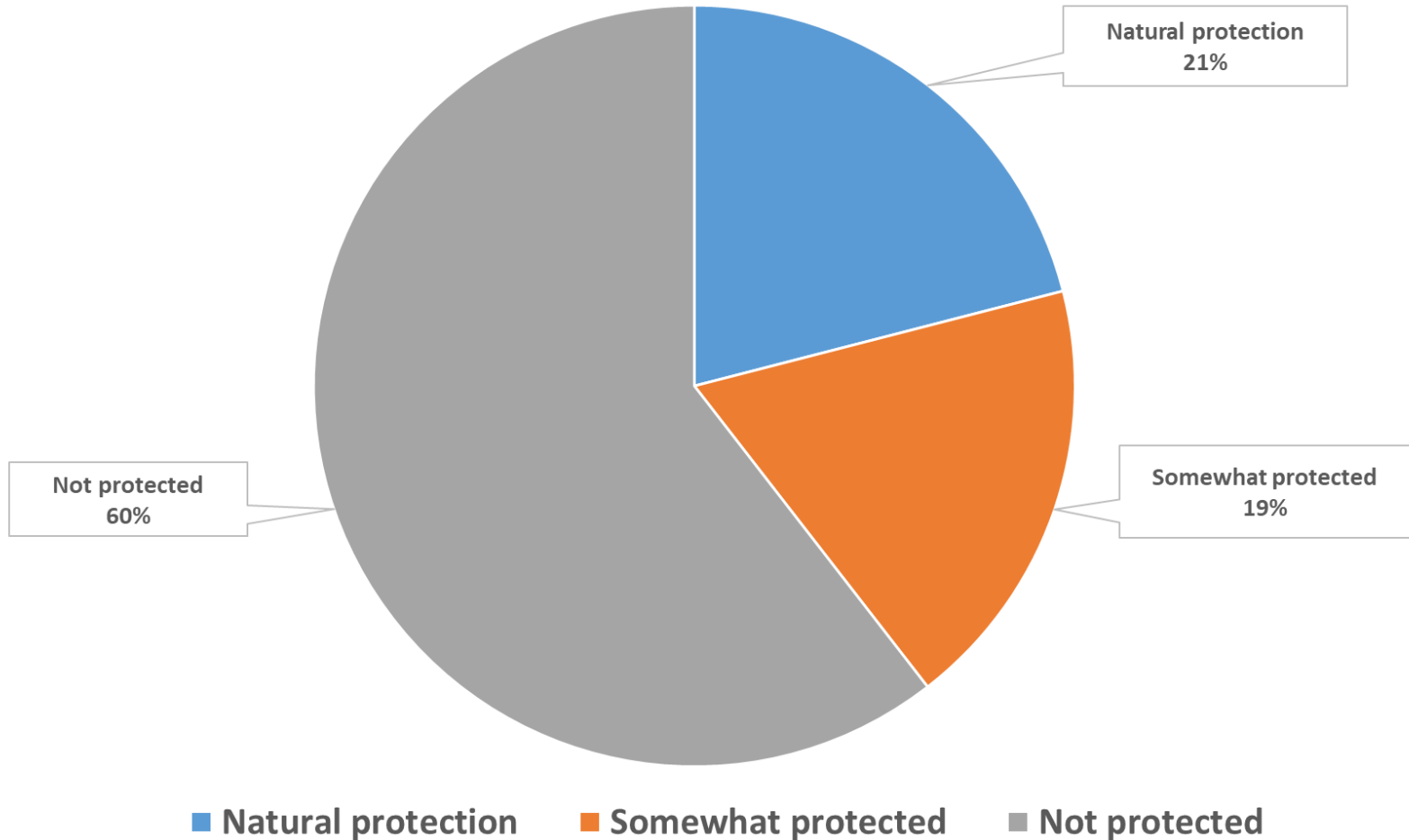
Природњачки музеј
у Београду

- 2020-2022
- research, conservation, education
- 6 protected areas: 5 RO, 1 SRB

Conservation in 81 man-made roosts



Conservation in 81 man-made roosts



Threats to roosts / colonies

- complete closing / collapse of mine entrances
- secrecy, paranoia, danger (state company for mining)



Threats to roosts / colonies

- disturbance / destruction of colonies
- rehabilitation of historic buildings (ex. crypts, cellars)



Conservation in 81 man-made roosts

- Almost all key sites are unprotected / exposed
- Tunnel at the Danube: 5 m from a road
- Sasca Montană mine: private property, uncooperative
- Piscul Nergu mine: entrance is collapsing

Thank you for your attention!



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