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

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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

- Arpașului mine, Făgăraș 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)

Banat / Iron Gates
Cross-border migration
Cross-border migration (RO - SRB)

• connection between Romanian and Serbian colonies
• *R. ferrumequinum, M. schrebersii* 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

• 2020-2022

• research, conservation, education

• 6 protected areas: 5 RO, 1 SRB
Conservation in 81 man-made roosts
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- Not protected: 60%
- Somewhat protected: 19%
- Natural protection: 21%
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!