

Bark beetle damage in Romania

Marius Paraschiv – National Institute for R&D in Forestry Braşov
Mihai Daniel Niţă – Transilvania University of Braşov



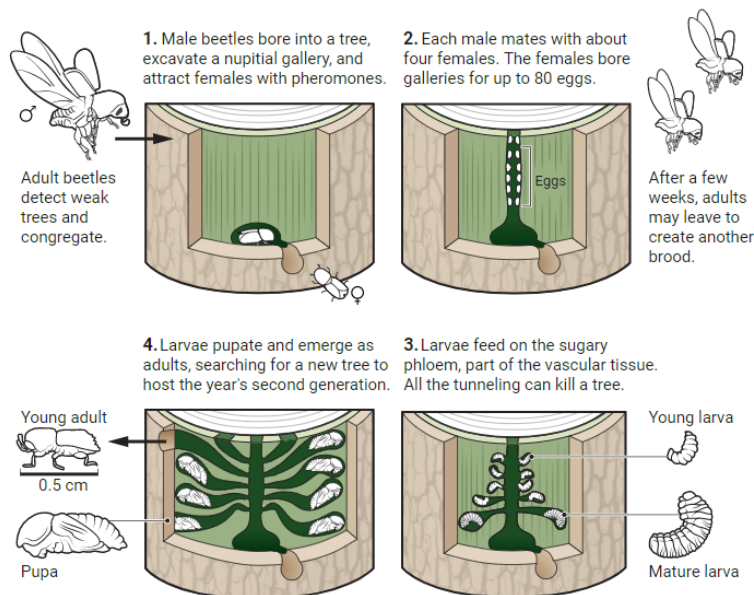
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ŞI EXPLOATĂRI FORESTIERE



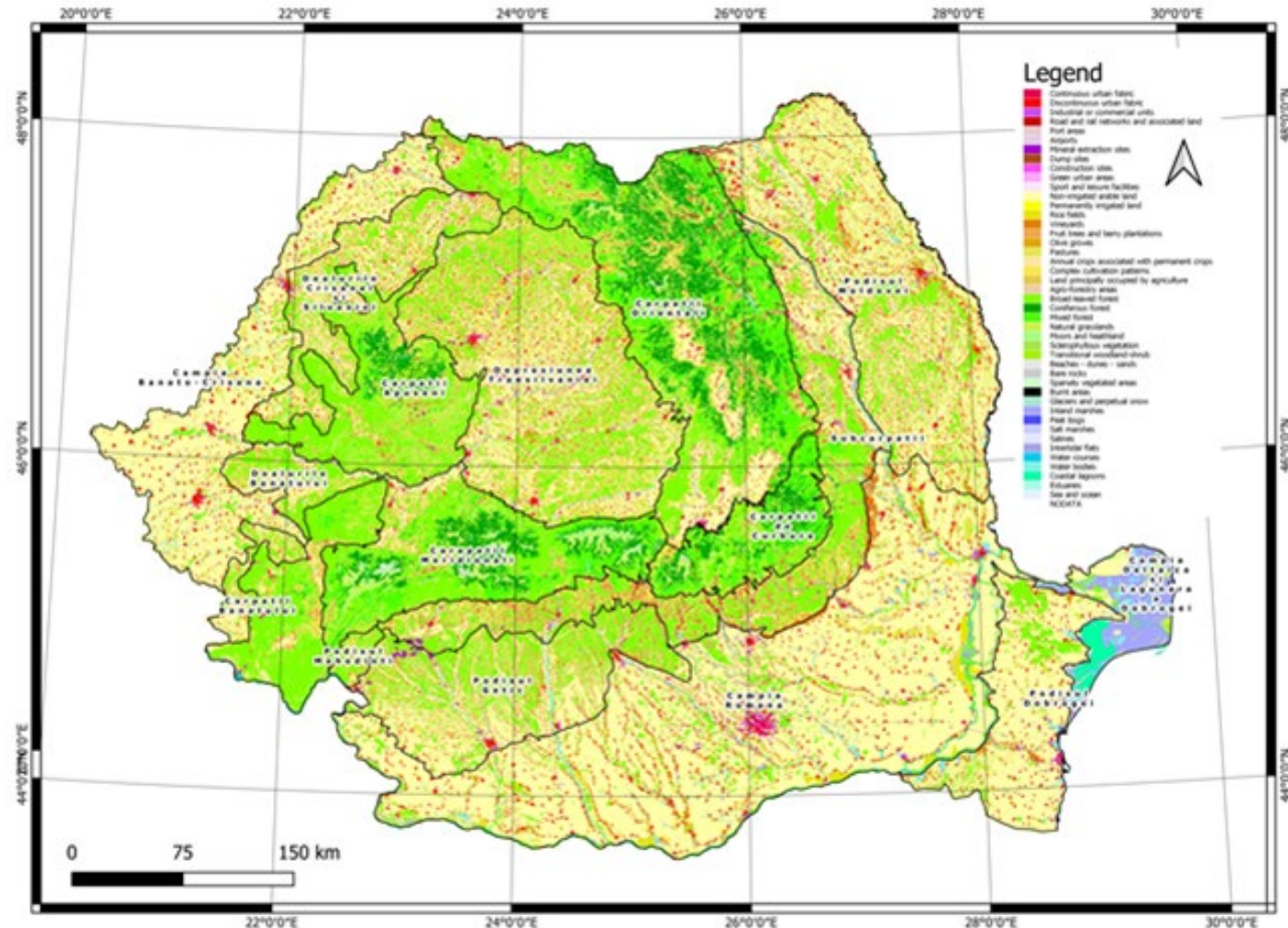
1. Affected species

Conifers

- Norway spruce – *Picea abies* (*Ips typographus*, *I. duplicatus*, *Pityogenes chalcographus*)
- European Fir – *Abies alba* (*Pityokteines ssp*)
- Scots pine - *Pinus sylvestris* (*Ips sexdentatus*, *I. acuminatus*, *Tomicus piniperda* and *T. minor*)



K. SUTLIFF/SCIENCE



References:

- 1) Simionescu et al. (2000) Forest Protection [in Romanian]
- 2) Map sources: CLC2018, Landform Units – Nita et.al 2009
- 3) K. SUTLIFF/SCIENCE

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2. Severity

- *variable*, but **intense between 2012-2016** with numerous outbreaks especially in spruce stands

3. Timeframe

- intensification of the frequency of outbreaks since 2011
- in the last years were reported less outbreaks (since 2018)
- we expect an increase in frequency starting with the spring of 2021

References:

2) Netoiu et al. (2021). The state of health of the forests in Romania in the period 2010-2020.
[in Print]



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4. Key factors and causes

Natural: Climate context

- increasing the frequency of drought periods during vegetation season
- increasing the disturbances frequency (e.g. windthrows – in 2020 more than 1 million of cubic meters)

Anthropogenic: Forest management

- conifer plantation outside of their natural range (e.g. *Picea abies* at elevation between 200-400 m a.s.l.)



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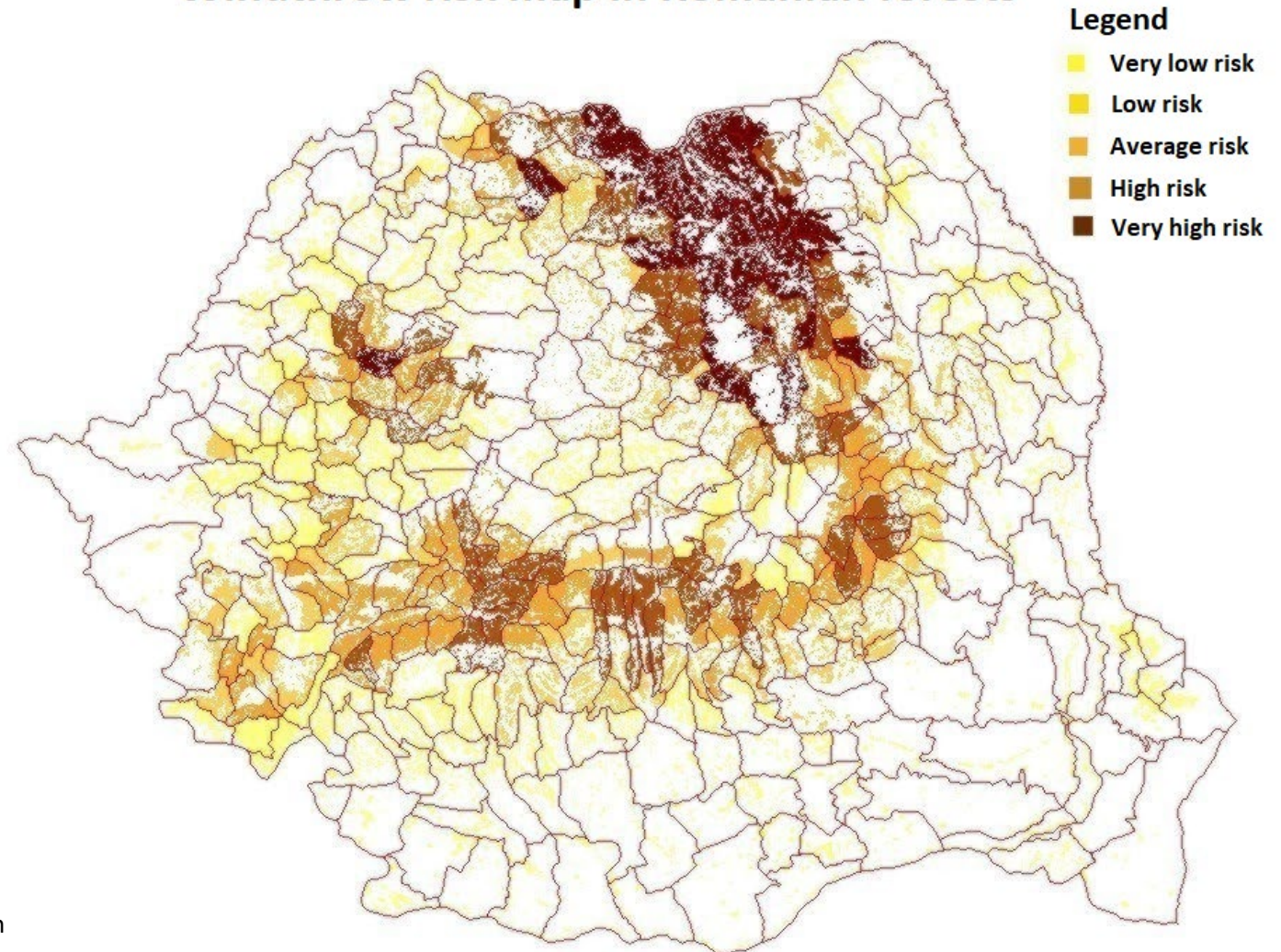


Windthrow risk map in Romanian forests

5. What has been done in Romania

Windthrow risk map:

- Identification of potential areas of BB outbreaks in the future
- Almost 750.000 ha of forest were assessed with very high risk (13%)



References:

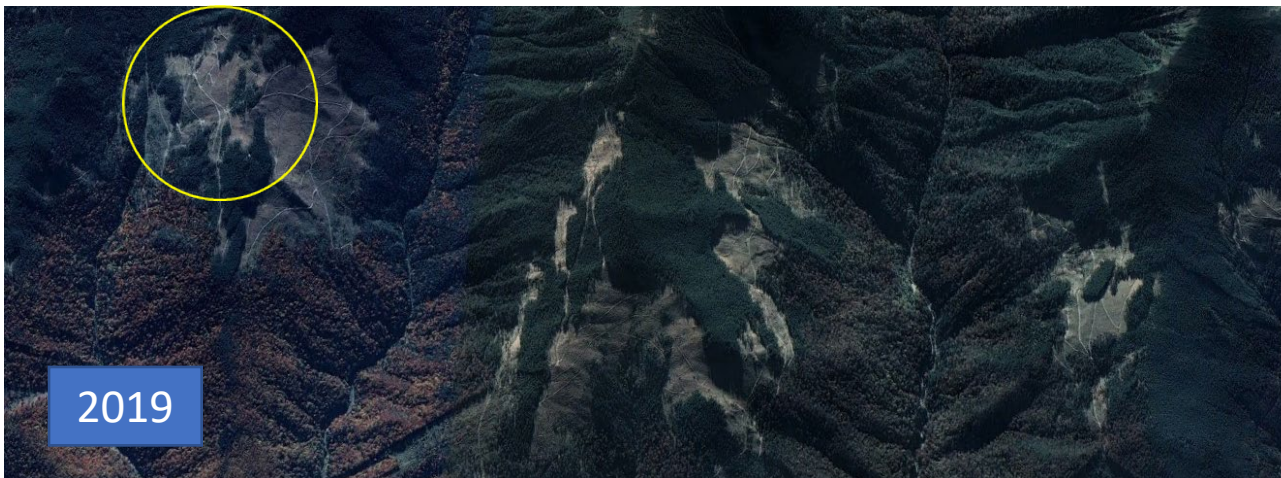
5) Dincă L., Cioloca N., Bujila M (2008). Windthrow risk map for Romania's forests [In Romanian] http://www.icasbv.ro/?page_id=532

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- Field monitoring of the outbreaks - ground observation
- Local area surveys (UAV) - detection
- Satellite comparison

References:

- 1) Google earth pro 7.3.3.7786 (64 bit) (December 31, 2011). Fagaras, Romania. 45.650868° N, 22.715176°E, Eye alt 18.05 feet. [January 19, 2021].
- 2) Google earth pro 7.3.3.7786 (64 bit) (June 12, 2014). Fagaras, Romania. 45.650868° N, 22.715176°E, Eye alt 7481 feet. [January 19, 2021].
- 3) Google earth pro 7.3.3.7786 (64 bit) (October 24, 2019). Fagaras, Romania. 45.650868° N, 22.715176°E, Eye alt 7481 feet. [January 19, 2021].