

FOREST INVASIVE SPECIES

Current and emerging problems, solutions and good practices in Republic of North Macedonia

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CURRENT SITUATION

- Institutions involved
 - Ministry of Environment and Physical Planning
 - Ministry of agriculture, forestry and water economy - Phytosanitary Directorate
 - Ministry of agriculture, forestry and water economy - Department of Forestry and Hunting
 - State Agriculture Inspectorate
 - Faculty of Forestry, Skopje

CURRENT SITUATION

- National legislation
 - Law on Nature Protection ("Official Gazette of the Republic of Macedonia" No. 67/2004, 14/2006; 84/2007; 35/2010; 47/2011; 148/2011, 59/2012 and 13/2013)
 - Definition
 - Forbidden import, exception for scientific purposes
 - Measures for prevention (Ministry of environment + Ministry of agriculture, forestry and water economy)
 - Law on plant health (Official Gazette of the Republic of Macedonia No. 29/05, 81/08, 20/09, 57/10, 17/11, 148/11, 69/13, 43/14, 158/14, 149/15, 39/16, 83/18 and 150/21)
 - Harmful organisms (insect, nematodes, bacteria, fungi, viruses, weeds and parasitic plants)
 - List of harmful organisms, plants and plant products that can transmit harmful organisms.

CURRENT SITUATION

- Forest coverage in the country
 - Total country area 25.713 km² or 2.571.300 ha
 - 35-40% forest

Area covered with forest in ha for 2024 year in Republic of North Macedonia	
Total area covered in forest	1 027 265
Deciduous forest	607 843
Coniferous forest	62 934
Mixed forest	315 426
Degraded forest	41 062
source: stat.gov.mk	

CURRENT SITUATION

- Invasive species database
 - Global Register of Introduced and Invasive Species - North Macedonia (<https://cloud.gbif.org/griis/resource?r=griis-macedonia>)
- National strategy for biological diversity and action plan
 - The National Committee for Biological Diversity composed of 20 scientists and experts in order to monitor the implementation of the Convention on Biological Diversity at the national level (to consider expert issues related to the conservation of biological diversity at the national level and to make appropriate recommendations)



Microsoft Excel
Worksheet

FOREST INVASIVE SPECIES

Species	Common name	Family	Used for	Negative effects
Amorpha fruticosa L.	Indigo bush	Fabaceae	Afforestation	Modification of landscape, water regulation
Robinia pseudoacacia L.	Bagrem	Fabaceae	Erosion control	Changes the soil quality, creates monoculture plantations
Acer negundo L.	American maple tree	Sapindaceae	Afforestation, erosion control	Grows quickly and shades out native species, changes wetland ecosystems, and suppresses native maple and willow
Ailanthus altissima (glandulosa)	Acid tree	Simaroubaceae	Afforestation and ornamental use	Releases substances that inhibit the growth of other trees, reduces diversity, ecosystem modifications
Gleditsia triacanthos L.	Honey tree	Fabaceae	Afforestation and ornamental use.	Creates dense and impassable plantations, Suppresses native flora, changes soil composition
Broussonetia papyrifera Vent.	/	Moraceae	Ornamental	Reduces biodiversity (leaves and fruits are dangerous for animals and insects)
Koelreuteria paniculata Laxm.	Golden rain tree	Sapindaceae	Wind protection	Modification of landscape
Solanum elaeagnifolium Cav.	Silverleaf nightplant	Solanaceae	/	It suppresses agricultural crops and native flora, It has long-lasting seeds (up to 10 years in the soil), Resistant to drought and herbicides

FOREST INVASIVE SPECIES

- Scientific literature

Species	Type	Host plant	Source
Corythucha arcuata	Insect	Quercus spp	Kiril SotirovSKI*, Katerina Srebrova, Sterja, Faculty of Forestry, "Ss. cyril and Methodius" University, Skopje, North Macedonia
Arion vulgaris	Gastropoda	Saplings of deciduous forests	ALEKSANDRA CVETKOVSKA-GJORGIEVSKA, IVAILO DEDOV, SLAVCHO HRISTOVSKI, MARIO LANGOUROV, STANISLAVA LAZAREVSKA, DANA PRELIK, NIKOLAY SIMOV
Leptoglossus occidentalis (western conifer seed bug)	Insect	Conifer trees, seeds	New records of allochthonous, invasive and pest invertebrate species from the Republic of Macedonia

HARMFUL ORGANISMS AS TREAT IN FOREST

- Not present in the country
- Annual phytosanitary monitoring program

Harmful organisms	Type	Host plants
Anoplophora chinensis	insect	Acer spp., Aesculus hippocastanum, Alnus spp., Betula spp., Carpinus spp., Citrus spp., Cornus spp., Corylus spp., Cotoneaster spp., Crataegus spp., Fagus spp., Lagerstroemia spp., Malus spp., Platanus spp., Populus spp., Prunus laurocerasus, Pyrus spp., Rosa spp., Salix spp. and Ulmus spp.
Anoplophora glabripennis	insect	Acer spp., Aesculus hippocastanum, Alnus spp., Betula spp., Carpinus spp., Citrus spp., Cornus spp., Corylus spp., Cotoneaster spp., Crataegus spp., Fagus spp., Lagerstroemia spp., Malus spp., Platanus spp., Populus spp., Prunus laurocerasus, Pyrus spp., Rosa spp., Salix spp. and Ulmus spp.
Popillia japonica	insect	Juglans, Acer, Aesculus, Betula, Castanea, Glycine, Platanus, Populus, Rosa, Salix, Tilia, Ulmus
Bursaphelenchus xylophilus and its vector Monochamus spp.	nematode	Abies Mill., Cedrus Trew, Larix Mill., Picea A. Dietr., Pinus L
Agrilus anxius	insect	Betula spp.
Agrilus planipennis	insect	Fraxinus L., Juglans ailantifolia Carr., Juglans mandshurica Maxim., Ulmus davidiana
Fusarium circinatum	fungi	Pinus
Phytophthora ramorum	oomicete	Acer, Quercus

GOOD PRACTICES AND SOLUTIONS

- General plan
 - Proper implementation of the national legislation regarding invasive species
 - establishment and regularly updating the national list of invasive species
 - increased border control for prevention of introduction of invasive species
 - increased monitoring in the territory of the country
 - better cooperation between institutions
 - delegation of activities to national scientific institutions
 - Mapping and identification
 - Early detection and intervention (mechanical and chemical treatment)
 - Raising awareness
 - Restoration of the degraded areas
 - Planting of autochthonous species