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# Book of Abstracts

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**FORESTRY**  
Bridge to the Future



International Conference, 5–8 May, 2021, Sofia, Bulgaria

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The International Scientific Conference  
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Editors: Marius Dimitrov, Svetoslav Anev, Stanimir Stoilov

Pre-pres: Svetoslav Anev

Cover design: Svetoslav Anev

University of Forestry, Sofia, Bulgaria

<https://ltu.bg/>

 Ysabeau Infant; Vollkorn

ISBN: 978-954-332-183-4

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**HEALTH SURVEILLANCE OF *PICEA OMORIKA* (PANČ.) PURKYNE  
IN THE NATIONAL PARK TARA USING SMALL UNMANNED  
AERIAL VEHICLE (SUAV)**

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*Picea omorika* (Serbian spruce), an extremely important species in terms of biodiversity conservation, is a Balkan endemic and Tertiary relict that is nowadays naturally distributed only along the middle course of the Drina River (an area of approx. 10,000 km<sup>2</sup> in eastern Bosnia and Herzegovina, and western Serbia). Natural sites of Serbian spruce are characterized by predominately unfavorable and impoverished conditions, where this species rarely builds pure stands and often occurs in association with tree species such as beech, silver fir, Norway spruce, Scots pine, and Austrian pine. As a result of climate change, increased activity of the most economically significant fungus *Armillaria ostoyae* (Romagnesi) Herink has been recently observed throughout western Serbia. For instance, dying of individual trees of Serbian spruce has been recorded in the National Park Tara. Keeping this in mind, the present study aimed to identify dead trees and those threatened by pests and diseases in the park area where this species occurred. Out of 21 natural sites (approx. 10,000 trees in total), the study was performed in hard-to-reach areas of Bilješka Stena. Due to the extremely difficult terrain, small unmanned aerial systems (sUAS) were selected for terrain mapping and data gathering. The aerial system consisted of DJI 4 Pro aircraft equipped with RGB camera, MicaSense RedEdge M 5-band multispectral sensor, and remote controller. The sampled area was 8 ha. Approximately 50 trees were directly identified as dead, while the application of vegetation indices (NDRE and NDVI) showed that a larger number of trees has lower index values in the area. The results of the study proved that the multispectral sensor and sUAV are useful tools for the early detection of tree stress, prediction of the dying process and planning the phytosanitary measures in the health monitoring of Serbian spruce stands in hard-to-reach areas.

**Keywords:** early detection of tree stress, multispectral sensor, Serbian spruce, small unmanned aerial systems, western Serbia