



D6.3 Practice Abstracts (A)

12/06/2025

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Pensoft Publishers (Bulgaria)



**Funded by
the European Union**

Prepared under contract from the European Research Executive Agency

Grant agreement No. 101134200

EU Horizon Europe Research and Innovation Action

Project acronym: FORSAID
Project full title: Forest surveillance with artificial intelligence and digital technologies
Project duration: 01.09.2024 – 28.02.2028 (42 months)
Project coordinator: Andrea Battisti, University of Padua (UNIPD)
Call: HORIZON-CL6-2023-GOVERNANCE-01-16
Deliverable title: D6.3 Practice Abstracts (A)
Deliverable n°: D6.3
WP responsible: WP6
Nature of the deliverable: Deliverable
Dissemination level: Public
Lead partner: Pensoft Publishers,
Recommended citation: Modova, N., Bozakov, P. (2025). Practice Abstracts (A). FORSAID project deliverable D6.3.
Due date of deliverable: Month 10
Actual submission date: Month 10

Deliverable status:

Version	Status	Date	Author(s)
1.0	Draft	10 June 2025	Neda Modova, Peter Bozakov (Pensoft Publishers)
1.1	Draft	18 June 2025	Andrea Battisti, Andree Cappellari (University of Padova)
2.0	Final	23 June 2025	Neda Modova (Pensoft Publishers)

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Preface

A key component of any Communication, Dissemination and Exploitation strategy is ensuring that project outcomes are accessible to a broad range of stakeholders and the wider public. As part of FORSAID's Plan for Exploitation, Dissemination and Communication of Results, Work Package 6 will produce and publish three sets of practice abstracts on the EIP-AGRI platform, supporting the European Innovation Partnership for Agricultural Productivity and Sustainability, starting with set A.

These abstracts will translate FORSAID's innovative findings into practical, user-friendly formats, enabling easy uptake and implementation by end-users. All practice abstracts will be made available on FORSAID's dedicated page on the EIP-AGRI platform and are also included in this deliverable document.

List of abbreviations

CAP: Common Agricultural Policy

EIP-AGRI: Agricultural European Innovation Partnership

EU: European Union

GDPR: General Data Protection Regulation

1 Introduction

The EIP-AGRI initiative, now integrated into the EU CAP Network, aims to promote a competitive and sustainable agriculture and forestry sector. Its mission includes supporting a stable supply of food, feed and biomaterials, while ensuring the responsible management of the natural resources essential to farming and forestry—always in alignment with environmental sustainability.

To achieve this, EIP-AGRI connects a wide range of innovation stakeholders across Europe—including managers, advisors, researchers, businesses and non-governmental organisations—bridging the gap between research and practical application. One of the key tools in this knowledge-sharing process is the practice abstract: a concise summary (1,000–1,500 characters) that presents key findings, recommendations or practices in a form directly useful to end-users.

As part of FORSAID's contribution to this platform, the first batch (A) of practice abstracts has been prepared and submitted, which can be found on this [page](http://ec.europa.eu/eip/agriculture/en/content/eip-agri-common-format). These include project outcomes formatted according to EIP-AGRI's common guidelines, available at: <http://ec.europa.eu/eip/agriculture/en/content/eip-agri-common-format>.

2 Practice abstracts

To ensure a consistent and high-quality presentation of all practice abstracts, FORSAID project partners received clear instructions, templates and examples. Drawing on the project's practical outputs and solutions, and adhering to the EIP-AGRI guidelines, the partners developed four practice abstracts. These are presented below.

2.1 FORSAID project presentation

Authors: Andrea Battisti (UNIPD, Italy), Andree Cappellari (UNIPD, Italy), Peter Bozakov (Pensoft Publishers, Bulgaria)

Forests provide essential ecosystem services, making their protection against environmental threats crucial. A growing challenge in Europe is the rapid spread of forest pests, which causes major ecological and economic damage. As demand for effective solutions increases, digital technologies are emerging as powerful tools to address this issue.

The FORSAID project brings together 17 partners from 10 countries to create an innovative, cost-effective toolkit for monitoring forest pests. Focusing on nine high-risk species (three fungi, five insects, and one nematode), the project aims to enable timely intervention to prevent forest degradation.

Across its six Work Packages, FORSAID will improve existing digital solutions and develop new ones. Remote sensing via satellites and drones will help to map areas of interest and identify pest disturbances. Automated detection devices will complement this effort on the ground by employing deep-learning algorithms capable of continuously analysing large amounts of

incoming data. In addition, automatic species identification will simplify and quicken detection. Environmental DNA analysis will further support early pest detection.

To ensure long-term impact and sustainability, economic assessments and stakeholder consultations will be conducted. Citizen science input will also be integrated to make tools accessible and user-friendly for professionals and the public. This multi-actor, interdisciplinary approach aims to deliver practical, scalable solutions for forest monitoring across Europe.

2.2 Stakeholders' involvement and needs

Authors: Benoît de Guerry (IEFC, France), Tam Do (IEFC, France), Christophe Orazio (IEFC, France)

Given the predominant academic background of the FORSAID consortium, it is crucial to ensure that the studies and innovations developed within the project will benefit a wide range of stakeholders and practitioners across the EU. A multi-actor approach is deployed as a backbone of the project to maximise impact and achieve transformative change towards a comprehensive forest pests monitoring system. In order to reach this overall goal, we initiated the creation of a Committee of Stakeholders, a panel of relevant practitioners with complementary activities and backgrounds (National Plant Protection Organisation, tree nurseries, forest owners, forest managers, customers, policymakers, urban tree managers) as well as an interest or expertise in forest pests. This committee will be involved at various stages of the project and contribute to the co-creation of the research actions. Different engagement methods will be implemented to benefit from the Committee of Stakeholders expertise:

- Consultation to better understand their concerns about quarantine pests, their regular use of technological tools for pest detection, identification and monitoring, and their need to improve these tools or develop new solutions.
- Share of knowledge and exploration of new challenges, *i.e.*, ethical issues with the deployment of artificial intelligence
- Review and assessment of the digital solutions developed within FORSAID in the field of remote sensing, ground sensors and citizen science.
- Support possible demonstration events.
- Co-creation of deployment guidelines to facilitate tools' wider adoption and the upscaling of the monitoring capacities. Decision support tools will be developed based on a joint cost-benefit analysis.

2.3 Neural network for remote sensing

Author: Yan Cheng (UCPH, Denmark)

Remote sensing technologies, like satellite, aeroplane and drone images, produce a large amount of data that can help monitor forest canopy health and detect pest damage across vast areas. However, analysing and interpreting such data volumes manually is slow and requires expert knowledge. In FORSAID, we use deep learning-powered computer vision to speed up and improve this process.

These deep-learning models are trained with images where pest-affected trees have been identified through field surveys or insect traps. By learning spectral and textural patterns in these images, the models can automatically detect similar occurrences in images of other areas. This enables us to find areas at risk or already affected, even in large and remote forest areas, and monitor changes in forest health over time.

Our goal is to improve early detection of pests in key tree species like oaks, pines and spruces, helping forest managers take timely actions to reduce damage, boost forest resilience and maintain ecosystem services.

Leveraging remote sensing coupled with computer vision, we aim to automate the production of large-area, yet spatially detailed, cover maps to address three main questions:

- Where are the key tree species located?
- Where and when has pest damage occurred?
- Where are future pest outbreaks most likely to occur?

Neural networks for remote sensing in FORSAID will complement other tools, like automated detection devices and environmental DNA, creating a comprehensive and scalable forest monitoring system.

2.4 Remotely Piloted Aircraft Systems (RPAS) for stakeholders

Authors: Andrea Battisti (UNIPD, Italy), Andree Cappellari (UNIPD, Italy), Alberto Santini (CNR, Italy)

Surveillance is fundamental to control the spread of plant pests. Currently, it relies on trained personnel visually inspecting plants for symptoms. Aerial surveys using RPAS, equipped with advanced cameras, may facilitate surveillance by spotting early signs of pests without needing to inspect every plant, especially in hardly accessible areas.

This method is particularly useful when infestations are sparse within landscapes or affect small-size trees that are difficult to detect with satellites. RPAS can capture images in hyperspectral, multispectral and thermal domains, helping to detect changes in trees caused by pests even before symptoms are visible and distinguish them from those caused by abiotic stress.

In FORSAID, we will focus on two key species:

- The pine wood nematode *Bursaphelenchus xylophilus*, which causes the pine wilt disease. This species is native to North America and was introduced in Europe (Portugal and Spain) in the late 1990s-2000s. The forests of Portugal have been particularly impacted, as they are mainly characterised by maritime pine *Pinus pinaster*, which is susceptible to the nematode.
- The fungus *Ceratocystis platani*, which is the causal agent of the lethal disease called canker stain disease. Also from North America, it is threatening plane trees, *Platanus* spp., in both urban and natural ecosystems in Albania, France, Greece,

Italy, Switzerland and Türkiye.

This approach is highly valuable for stakeholders including forest managers and nursery operators, as it allows for quicker responses to pest outbreaks, helping to limit their spread and reduce economic and ecological damage. In addition, it supports more targeted interventions, an efficient resource use and better long-term management of landscapes.

3 Conclusion

The initial batch (A) of four practice abstracts will serve as the foundation for FORSAID's presence on the EU CAP Network website. These abstracts are now published on the dedicated FORSAID page within the platform. A second batch (B) of practice abstracts is planned for release in Month 27 and will be included in the upcoming deliverable **D6.4 – Plan for Exploitation, Dissemination and Communication of Results (M27)**.