

**TERMS OF REFERENCE**  
for the procurement procedure  
for  
**alert system services**

within the project: „*Cooperating for safeguarding biodiversity and ensuring viable human-wildlife coexistence in the SKROUA transboundary area - COOP4SAFE*”

Early Warning System on Human-Wildlife Conflicts in Maramures, Romania

## 1. Background and Context

Human-wildlife conflict (HWC) is a growing challenge, particularly in areas where large carnivores such as brown bears, wolves, and lynx coexist with human communities. Current approaches to HWC are largely reactive, with intervention units responding only after an incident has occurred. Many such incidents remain unreported or unnoticed until escalation, hampering timely mitigation and increasing risks for both people and wildlife.

Recent technological advancements have enabled the development of real-time wildlife monitoring systems that facilitate early detection and proactive intervention, offering customizable alert mechanisms and long-term data management, improving both conservation efforts and public safety outcomes.

To operationalize such a system locally, a solution is needed that can:

1. Detect large carnivores in real time using AI-enabled trail cameras.
2. Process image and identify bears (image classification)
3. Generate an alert for Intervention Units
4. Allow data collection and integration into predictive analytics models for proactive conflict prevention and produce risk maps to allow further prioritization of interventions via the early warning systems.

## 2. Objective

The objective of this ToR is to define the framework for procuring, adapting, and implementing a preventive animal detection and alert system using AI-equipped, network-connected trail cameras that recognize brown bears and automatically notify intervention units.

## 3. Scope of Work : The service provider will be responsible for the following components:

### 3.1. System Setup and Configuration

Configure trail cameras (provided by the beneficiary and project partners) with the following specifications:

- Image Resolution: 5MP to 32MP
- Video: Full HD 1080P with audio
- Infrared Detection: 940nm no-glow, 59 LEDs, 20m range
- PIR Sensitivity: Adjustable L1–L9
- Wireless Module: LTE Cat1 (EU version)
- GPS Module: Enabled
- Battery Life: Up to 6 months
- Ingress Protection: IP66

## PARTENERIAT FĂRĂ FRONTIERE

Acest document a fost realizat cu sprijinul financiar al Uniunii Europene. Conținutul său este responsabilitatea exclusivă a WWF-România și nu reflectă neapărat punctele de vedere ale Uniunii Europene.

Integrate cameras with AI-based image recognition software capable of identifying the brown bear (*Ursus arctos*).

### 3.2. Software Adaptation and Customization

Modify camera firmware/software to:

- Automatically transmit images and metadata to a an external server or platform.
- Route alerts to intervention agents are send through a mobile App to a desktop application
- Maintain data logs for later analysis.

### 3.3. Deployment and Field Testing

- Provide assistance and instructions for camera installation in high-conflict or high-risk areas identified by the beneficiary and project partners.
- Calibrate PIR sensors, image classification, and other camera functions.
- Conduct real-time functional testing in coordination with the beneficiary.
- Ensure reliable image transmission using mobile networks.

### 3.4. Data Management and Integration

- Store and back up image and alert data on a secure cloud or physical server.
- Integrate data into a GIS database and web platform accessible to project partners.
- Facilitate integration with predictive models or analytics platforms.
- Support future enhancements such as a Human-Wildlife Conflict radar.

## 4. Deliverables

1. Firmware modification and server configuration
2. Deployment and successful testing of 40 camera units
3. Fully functional alert routing system for Maramures, Romania
4. Technical documentation of the alert system: describing the system's components, functionality, and integration. This should include, for example, details on equipment, software, image processing, alert mechanisms, and data management, sufficient to ensure operational clarity and future usability.
5. Final report with performance evaluation and recommendations

## 5. Key Responsibilities

Service provider:

- Customise firmware and software.
- Provide technical support and training.
- Ensure full functionality, integration and compatibility of the system.

Beneficiary:

- Supply trail cameras and equipment via the project partner
- Provide SIM cards and mobile data subscriptions via the project partner
- Coordinate field deployment.
- Facilitate contact with local agents and logistical support.

## 6. Timeline

## PARTENERIAT FĂRĂ FRONTIERE

Acest document a fost realizat cu sprijinul financiar al Uniunii Europene. Conținutul său este responsabilitatea exclusivă a WWF-România și nu reflectă neapărat punctele de vedere ale Uniunii Europene.

The assignment will be carried out with deliverables aligned to project milestones. The contract and all associated deliverables must be completed by **31 December 2026**. An extension beyond this date may be considered **if both parties agree in writing**, subject to revised terms and conditions.

## 7. Qualifications and Experience

Eligible applicants must demonstrate:

- Experience with AI-based image recognition tools and platforms.
- Technical expertise in camera trap systems
- Familiarity with wildlife monitoring and conservation technologies.
- Proven ability to develop or adapt firmware/software for field use.

## 8. Reporting and Communication

- Within the COOP4SAFE project, the service provider will report directly to the Project Manager and the Project Supervisor, who will oversee the implementation and progress of the assignment.
- Progress updates will be provided at agreed intervals, defined at the contract stage.
- All communication and documentation will be in English.

## 9. Evaluation Criteria

Proposals will be evaluated based on the following criteria:

- Technical feasibility and innovation
- Cost-effectiveness and value for money
- Relevant experience and past performance

## 10. Approval

These Terms of Reference outline the framework for the procurement and implementation of alert system services under the COOP4SAFE project. It serves as the basis for engagement, coordination, and delivery of services in alignment with project objectives and timelines.

**11. Annexes** – The following annexes form an integral part of these Terms of Reference and must be completed and submitted by the bidder as part of the offer dossier:

- **Annex 1** – Template: **Declaration of conflict of interest**
- **Annex 2** – Template: **Technical offer Form**
- **Annex 3** – Template: **Financial Offer Form**
- **Annex 4** – Template: **Experience**

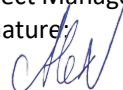
Date: 18.09.2025

### Prepared By:

Dr. Zoltán D. Szabó  
Technical expert RO

### Approved by:

Alexandra Verdes  
Project Manager  
Signature:



## PARTENERIAT FĂRĂ FRONTIERE

Acest document a fost realizat cu sprijinul financiar al Uniunii Europene. Conținutul său este responsabilitatea exclusivă a WWF-România și nu reflectă neapărat punctele de vedere ale Uniunii Europene.