Terms of Reference

Remote Sensing Analysis of Landscape Rewilding Metrics, Phase 1

Context

In 2023, Rewilding Europe (RE) developed an ecological impact monitoring framework to align and enhance the monitoring efforts across its 10 rewilding landscapes. A detailed cost-benefit analysis was conducted to identify the most effective and scalable metrics and methods for monitoring the diverse natural processes, ecosystems, and species involved.

Given the scale of RE's initiatives, the anticipated geographic extent of ecological changes, and the need for cost-efficient monitoring, RE determined that remote sensing via satellite imagery is the most suitable method for tracking some of the key metrics over time. These metrics relate to the rewilding of forests, peatlands, rivers, and natural grazing dynamics. With feasibility and cost-effectiveness in mind, RE plans to use freely available remote sensing products commonly used by public and private sectors for ecosystem change monitoring. This approach will help RE generate the necessary data and establish workflows to independently derive these metrics in the future. This phase will also guide further phases by identifying any needed workflow adjustments.

A preliminary assessment was conducted to select the most appropriate datasets for each metric, which will serve as the foundation for this assignment (see Annex 1).

Objectives

The objectives of this assignment are to:

1. Review RE's preliminary assessment of data sources to confirm whether they are the latest market-leading, freely available remote sensing products. If not, suggest more suitable alternatives.
2. For each data source and metric, acquire datasets, develop data processing, analysis, and visualization workflows and document them in RE's monitoring protocol format
3. For each data source and metric, implement the developed workflows to derive results for the selected metrics at the chosen sites and scales and create visualizations.

Scope of Work

The scope of work for this consultancy is broken down according to the objectives above. Please refer to Annex 1 for details on the metrics to be measured, scales, as well as preliminary list of data sources to be evaluated and/or used. The consultant is expected to undertake the following key tasks:

Review RE's Preliminary Assessment of Data Sources:

- *Benchmark against current standards:* Compare the data sources with widely used public remote sensing products from NASA and ESA. Ensure they effectively track metric changes over time and list NGOs and businesses using these products.
- *Identify gaps and recommend alternatives:* Highlight any outdated sources, suggest better options that meet current standards, and ensure they are regularly updated and freely available. Make a final choice of data sources, per metric and explain rationale

Data acquisition, processing and documentation:

- Source appropriate data sources from the data provider using scripts whenever possible, otherwise documenting the process in detail.
- Document choice of methodology, including data processing, analysis, and visualization workflow following RE's monitoring protocol template

- Create scripts that will allow RE to repeat the work done in this consultancy in the future to add new data points in time

Implement the developed workflows to derive results and visualizations:

- Calculate the metrics at each of the sites and scales, as per Annex 1
- Create examples of how change over time for each metric can be visualized through maps and/or summarized in figures. Ideally this is done in a dashboard format.

Deliverables

The consultant is responsible for providing the following deliverables:

1. **Evaluation Report:** Review of RE's preliminary data sources assessment, benchmarking with current standards, explaining the rationale for the final choices
2. **Data Package:** All selected data sources uploaded to our data repository, organized, and made accessible.
3. **Methodology Documentation (i.e., Monitoring Protocols):** Detailed documentation of methodologies per metric, including pre-processing steps. Use of RE's monitoring protocol template and well commented scripts is a must.
4. **Metric Results Report:** Results of the derived metrics, using the chosen data sources and methodologies.
5. **Visualization Dashboard:** Create maps, figures, and an interactive dashboard to display changes over time for each metric for each landscape.

Payment Schedule

The payment schedule for this consultancy will be 30% upon signing the contract, 30% upon completion and approval of deliverables 1, 2 and 3 and 40% at the end of the assignment upon approval of the remaining deliverables.

Qualifications, Skills and Experience

- **Qualifications –** Advanced degree (M.Sc. or Ph.D.) in remote sensing, geospatial science, environmental science, or a related field, with relevant professional certification in remote sensing or GIS (e.g., GISP, GIS Professional).
- **Relevant Experience** - At least 5 years of experience in remote sensing, with a focus on ecological or environmental monitoring; Demonstrated experience with similar projects focused on automating data acquisition, processing, analysis, and visualization, particularly in rewilding or conservation contexts; Ability to handle large datasets and ensure cost-effective solutions.
- **Remote Sensing and Satellite Imagery** - Expertise in using best practices in remote sensing to access, process, analyze, and visualize publicly available satellite imagery.
- Proficiency in Google Earth Engine, Python, R, or other open-source platforms.
- Proficiency and access to ArcGIS Pro, ArcGIS Online, and ArcGIS Dashboards
- **Programming and Scripting** - Experience with creating scripts for automated workflows.
- **Visualizations** - Skills in visualizing and presenting data, including creating maps and dashboards (preferably in ArcGIS Dashboards or PowerBI); Ability to summarize complex data in clear, accessible formats.

Timeline

This assignment will start on October 25th and will be completed within a six-month period.

Proposal Details

Applicants are requested to submit a proposal (4-6 pages) that includes the following sections:

- **Understanding of the Assignment** - Brief overview of your understanding of Rewilding Europe's objectives, key challenges, and the specific tasks outlined in the ToR.
- **Approach and Methodology** - Outline your proposed approach and methodology to achieve the objectives. Include a detailed work plan with timelines, key milestones, and the tools/technologies you will use.
- **Qualifications and Experience:** Outline your team's composition, including roles and responsibilities. Highlight relevant experience with similar projects, especially in remote sensing and ecological monitoring. Attach resumes/CVs of key team members and provide examples of a dashboard and maps your team has created.
- **Budget Estimate** - Provide a budget breakdown by task and deliverable, including all anticipated costs. Include a brief justification for the proposed budget.
- **Timeline and Deliverables** - Present a project timeline with key milestones and delivery dates. Ensure alignment with the assignment's objectives and scope.
- **Risk Management** - Identify potential risks associated with the project and suggest mitigation strategies. Propose contingency plans for challenges that may arise.
- **References and Supporting Documents** - Provide references from previous clients on similar projects. Include any additional supporting documents, such as certifications or previous reports.

Guidance for budgeting:
While this Request for Expression of Interest does not specify a fixed budget, we encourage candidates to provide a preliminary budget estimate based on the scope and objectives outlined in this document. Please consider the following when preparing your response:

- **Project Scope and Complexity:** The proposed budget should reflect the scale and complexity of the tasks described, including the expertise required and the anticipated time commitment.
- **Cost-Effectiveness:** We are seeking a balance between cost efficiency and high-quality outcomes. Proposals should demonstrate how the proposed budget aligns with the value delivered.
- **Funding Constraints:** While there are no specific budgetary limits disclosed at this stage, respondents should be mindful that cost-effectiveness will be a key consideration during the selection process.
- **Detailed budget breakdowns**: We welcome this as part of your submission, which will help us assess the financial feasibility of your proposed approach.

How to Apply

Interested candidates should submit the following information:

- A cover letter outlining their suitability for the role and relevant experience
- CV
- Examples of previous work related to remote sensing and environmental monitoring. Ideally at least one map, one figure showing change over time, and one dashboard.
- Proposal (4-6 pages)
- Applications should be sent via email to hr@rewildingeurope.com with "Remote Sensing Consultancy" in the subject line, no later than 27th September, 5:00 pm CET.
- Shortlisted candidates will be contacted on 1st week of October and interviews will be held shortly after that.

Annex 1 – Metrics to be derived at site and landscape scales

Rewilding Models	Natural Grazing		Forests		Rivers
Metrics	**Area Burned**	**Fire Intensity**	**Canopy Gaps**	**Tree Cover**	**Riparian vegetation width and cover**
Potential Data Source	**MODIS**	**FIRMS**	**Copernicus (CLMS)**		
Site Scale					
CA - Castel Madama				X	
CA - Giovenco River					X
CA - Liri River					X
DD - Tarutino	X	X			
AD - TBD	X	X	X	X	
GCV - Ermo das Aguias	X	X			
GCV - Paúl dos Toirões				X	
IH - Cabrilla's river					X
IH - Checa			X	X	
IH - Solanillos	X	X			
RM - Boynik horse area	X	X			
RM - TBD				X	
SC - Bison area			X	X	
SL - Abrams river					X
SL - Ume river valley			X		X
VM - Ramino korito			X	X	

Table 1. Metrics to be derived, and potential data sources to be used, at site scales (200 ha – 9.000 ha)

	Metrics	Potential Data Source	All Landscalpes (11)
Natural Grazing	Area Burned	MODIS	X
	Fire Intensity	FIRMS	X
Forests	Canopy Gaps	Copernicus (CLMS)	X
	Tree Cover		X
	Above-Ground Carbon Storage		X
All Models	Surface temperature	Copernicus (ERA5)	X
	Snow Cover	Copernicus (Snow Cover)	X
	Precipitation	CHIRPS	X
	Drought index	Sentinel-2	X
	Moisture index		X
	Vegetation health index (NDVI)		X
	Landcover	WorldCover (ESA)	X

Table 2. Metrics to be derived, and potential data sources to be used, at landscape scale (average 470.000 ha)