Eberswalde University for Sustainable Development

Bridging Technology and Trust: Drones, Data, and Community-Driven Ecological Restoration in Wales

Research Project Plan for **Research Term 2026**

Methodological support:

Digital Innovation & Learning Lab (DiLeLa), HNEE

Submitted by:

Fabian Bona

Introduction

Wales has only 15% woodland cover and a low rate of afforestation. The recently introduced Sustainable Farming Scheme is designed to encourage farmers to incorporate tree-planting, the creation of ecological corridors and nature-based solutions into their land management practices. This research project is based in Wales, where the project partner is actively developing planting site-adapted native species to build ecological corridors, promote biodiversity, and increase stakeholder trust. The project explores how UAV-based spatial monitoring and qualitative research can be combined to document this transformation transparently, communicate its progress to diverse audiences, and examine how data builds trust in restoration processes.

Central question: How can digital data strengthen trust in restoration processes, increase community participation, and make ecological progress transparently visible?

WHY?

The research is based on two challenges in the field of restoration work. Firstly, community-led tree planting initiatives frequently lack accessible evidence of their ecological and social impacts. This can limit transparency towards stakeholders. Secondly, spatial monitoring technologies are often not integrated with storytelling, which is key to building stakeholder trust and securing long-term funding.

WHAT?

The project will work towards three interconnected outputs:

A spatial baseline. Georeferenced drone surveys of the research sites are processed into orthomosaics and analysed for spatial structure indicators. This creates a repeatable record of the site at a fixed point in time, enabling future comparisons of ecological change.

Community narratives. Semi-structured interviews with people connected to the land help to explore how they experience and perceive the changes around them. It can also tell us what forms of communication they find meaningful and trustworthy.

An interactive GIS-StoryMap. A public web-dashboard that layers spatial data with human stories, drone footage, ecological indicators and creative soundscapes into a coherent, navigable narrative. The StoryMap designed to function as a living Impact Report that partners can share with their own audiences.

HOW?

Drone surveys will capture imagery to map trees on different planting sites. Qualitative data collection through semi-structured interviews will document volunteer motivations, experiences, and perceived impacts of their involvement in tree planting. These datasets will be elaborated through a StoryMap platform that layers spatial data with narrative content, creating a multimedia communication space. Technical and methodological support is provided by the Digital Innovation & Learning Lab at HNEE throughout the process.

WHERE?

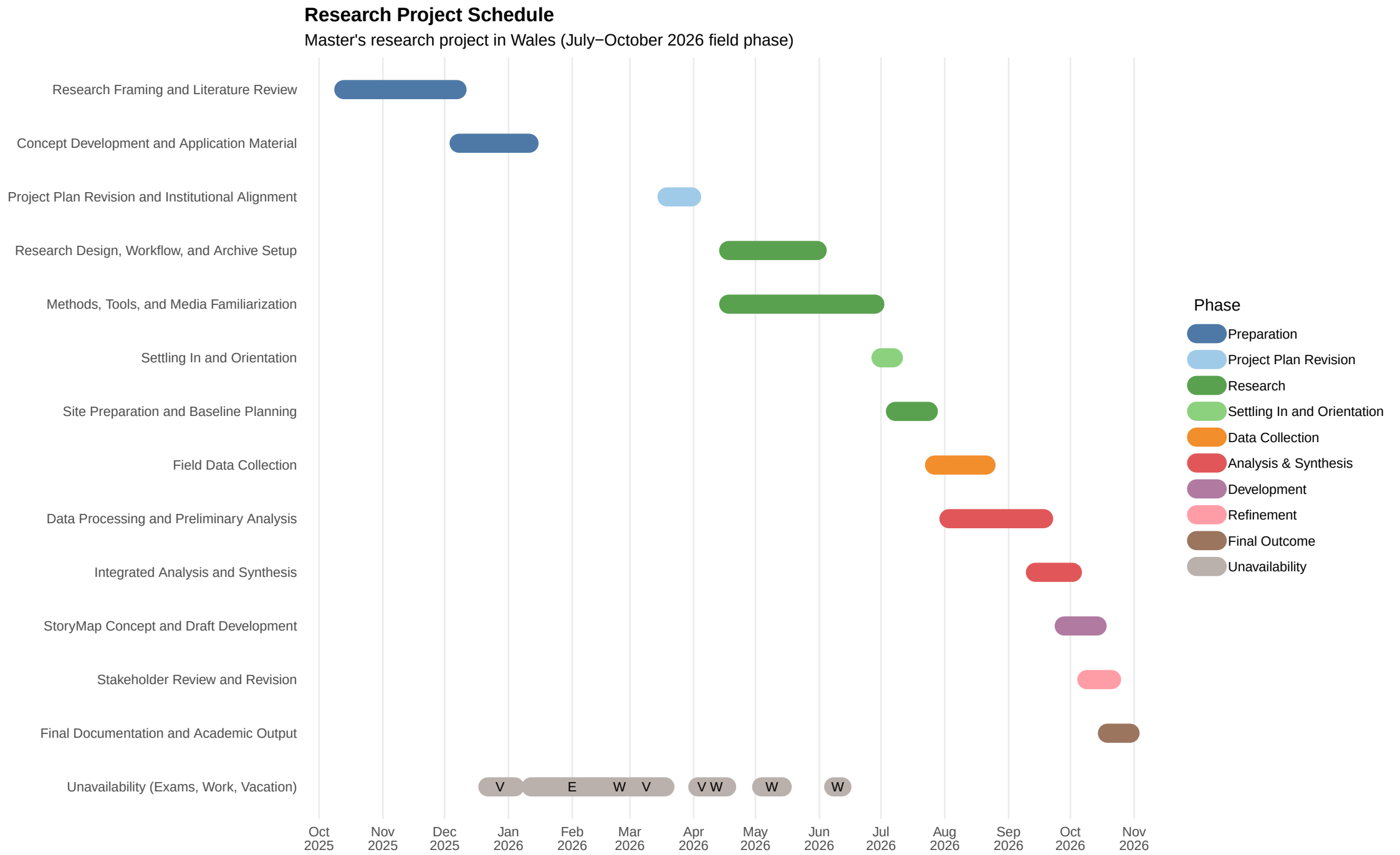
The primary study area is located in South Wales, selected in collaboration with the project partner. The partner provides access to recently planted native tree species and opportunities for volunteer engagement.

WHEN?

The project spans from July to October. The preparation, such as tool testing and familiarizing and methodological design begins in spring 2026. The final StoryMap and research report are delivered by the end of October 2026.

WHO?

The StoryMap can be used to communicate with the public, report to funders, engage volunteers, or advocate for policy. The spatial baseline is important because every future survey adds to a growing, comparable record of change. The research findings show how ecological documentation and community participation can be combined at a local level. The project is coordinated by Fabian Bona acting as the connection between project partners and the DiLeLa at HNEE. Partners provide site access and contextual knowledge. DiLeLa provides technical and methodological expertise. The result is a shared output that belongs to everyone: landowners, research partners and the public.


Research Project Schedule
Master's research project in Wales (July−October 2026 field phase)
Research Framing and Literature Review
Concept Development and Application Material
Project Plan Revision and Institutional Alignment
Research Design, Workflow, and Archive Setup
Methods, Tools, and Media Familiarization
Settling In and Orientation
Site Preparation and Baseline Planning
Field Data Collection
Data Processing and Preliminary Analysis
Integrated Analysis and Synthesis
StoryMap Concept and Draft Development
Stakeholder Review and Revision
Final Documentation and Academic Output
Unavailability (Exams, Work, Vacation)
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Oct 2025
Nov 2025
Dec 2025
Jan 2026
Feb 2026
Mar 2026
Apr 2026
May 2026
Jun 2026
Jul 2026
Aug 2026
Sep 2026
Oct 2026
Nov 2026
Phase
Preparation
Project Plan Revision
Research
Settling In and Orientation
Data Collection
Analysis & Synthesis
Development
Refinement
Final Outcome
Unavailability

Project Canvas

GIS-based digital story map

communicating ecological and social impact of tree planting campaing

UAV survey for geo-referenced mapping and qualitative storytelling

Goals

Short-term Goal (1 months)
By Week 4, prepare for field and UAV data collection at Bryn Arw by finalizing site selection, securing UAV and GPS equipment, and conducting a literature review of similar reforestation monitoring projects, ensuring readiness for baseline surveys.

Mid-term Goal (1–2 months)
By Week 10, complete field and UAV data collection to assess tree survival and early growth at Bryn Arw, producing a georeferenced dataset of at least 1,000 planted trees and validating 10% through ground-truthing, and simultaneously collect volunteer narratives through at least 15 interviews and 30 photovoice images.

Long-term Goal (End of Project)
By Week 14, deliver an integrated GIS-based story map combining ecological monitoring data and volunteer narratives, and evaluate its impact on stakeholder engagement by collecting pre/post feedback from at least 20 participants, including results in the final project report.

Research questions

How can GIS-based digital story mapping effectively communicate the ecological and social impact of community-led tree planting initiatives in South Wales, UK?

~~What are the key factors influencing successful restoration outcomes?~~

How effective is drone-based monitoring in capturing the survival and growth of newly planted trees in South Wales?

How can GIS-based story maps combine ecological monitoring and community narratives to visualize the social-ecological impact of tree planting in South Wales?

Stakeholders/actors and partners

Stomp Up For Trees

Coed Cadw (Woodland Trust Wales)

UK Forest Research (technical expertise)

Bangor University's forestry/land-use research

NRW (Natural Resources Wales)

CAT (Centre for Alternative Technology)

Activities

Data Collection & Ecological Monitoring
drone surveys, tree survival/growth, mapping

Social Research
interviews, volunteer engagement surveys

Integration & Communicatio
GIS story map design, combining data + stories

Impacts

SUFT:
communication with funders & communities

Volunteers:
increased ownership and awareness of reforestation.

Academia:
A pilot model for linking ecological + social monitoring in reforestation.

Policy:
Demonstrates role of participatory GIS in Wales' climate/forest policy.

Network:
linking HNEE, CAT/Bangor University

Context

Product Manager

Head of B2B online

Head of Marketing

Head of Product

Needs

Field Equipment: Drone, measuring tools

~~Computer and Software~~
done

~~Car~~
done

Office

Supervisor and project partner
urgent

Resources

Scholarships (PROMOS, HAW.International, ERASMUS, Leonardo)

BAföG

Outputs

Digital story map

Report

Dataset of mapped trees

Interview feedback dataset

Master's Thesis

Risks

Ecological:
Seedlings too small for UAV detection → mitigate by mapping planting rows + ground-truthing

Social:
Volunteer fatigue / low engagement → mitigate by co-designing story map with them.

Time:
Bad weather for drone flights → build time buffer.

Milestones

Week 2–4:
Site selection finalized, UAV and GPS equipment tested, literature review completed.

Constraints

Scope

Create a GIS-based StoryMap that visualises SUFT's tree-planting progress in South Wales using drone imagery. Combine spatial analysis + volunteer narratives to promote transparency and community engagement.

3-month limited timeframe

Flights depend on weather

Equipment availability

Young seedlings maybe not detectable

giants

rays of sun dance through the leaves
a play of light nature weaves
the wind blows soft
the wind blows strong
makes trees to sway along
the wind blows low
presenting a gentle show

once giants were standing loud
majestic, unique and proud
now old giants stand a few
but bannau and valley keep
memories of the welsh deep

what now lays bare
the future shall bear
seeds of hope
for you, him and her
plenty, vivid and young
stretching towards rays of the sun
and so a new story begun

Fabian Bona, 2022