



snap & save  
SACHA group 10

# SNAP & SAVE

PEATLANDS BIODIVERSITY  
MONITORING

**-REPORT-**



# CONTENTS

Introduction & Proposal Overview	1-2
Data Analysis	3-4
The Plan	5
App Design	6
Timeline & Costs	7-10
Identifying Stakeholders	10-11
Potential Partnerships	12
Ensuring Equitability for All	13-14
Benefits	15-17
Conclusion	18
Bibliography	19





# INTRODUCTION

Peatlands are among the most valuable ecosystems in the country - rich in biodiversity, vital for carbon storage, and essential for climate regulation. Yet, despite their ecological significance, these habitats remain under-monitored and under-appreciated by the general public, with biodiversity engagement and conservation efforts often limited by a lack of accessible tools and public awareness. In response to this challenge, we propose a digital solution aimed at bridging the gap between conservation science and everyday citizen participation – the ‘Snap and Save Peatlands’ app.

## Proposal overview

We acknowledge that the University of Edinburgh’s Forest and Peatland programme is an innovative scheme of land ownership, designed to directly sequester the inevitable carbon emissions from students’ flights, to restore natural ecosystems via afforestation and peatland restoration, and to enhance biodiversity across Scotland. But we also believe that there is potential for so much more. Our proposal to ensure biodiversity interventions are equitable for all, both now and in the future, involves a tri-pronged approach:

- **Engaging with and empowering local communities to become involved in the conservation of animal and plant species.**
- **Ensuring equitable access to green space by providing resources and building connections with deprived communities.**
- **Utilising citizen science and technology to improve monitoring across Forest and Peatland programme sites.**



Biodiversity is being depleted at an unprecedented rate both locally and globally: between 1970 and 2020, the Earth's total biological diversity declined by 73% (WWF, 2024). Scotland is one of the world's most nature-depleted countries: it is ranked 212<sup>th</sup> out of 240 countries on the Biodiversity Intactness Index, and one in nine Scottish species are threatened with extinction (Mercer et al., 2024). The Forest and Peatland programme aims to mitigate against this by developing and restoring forest and peatland habitats on 887 hectares of land across sites across Scotland.



Our proposal, the Snap & Save Forest and Peatlands project, aims to promote the use of existing technology amongst members of the public in order to spread awareness of biodiversity conservation and provide monitoring for the improvement of the Forest and Peatland programme to continue to improve. The Seek app by iNaturalist is an accessible and reliable resource for recording biodiversity; over time, we aim to build a database that reflects the diverse range of plant and animal species at each site, which rangers and planners can then use to inform strategies to maximise the potential of biodiversity interventions.

---

snap & save  
group 10





## UNDERSTANDING THE CHALLENGE THROUGH DATA

Data from Scottish Government (2021). Distance to Green or Blue Space - Scottish Household Survey shows that there are significant social stratification and geographic differences in the accessibility of green space resources. Only 62% of the poorest 20% of the population can reach a green space within 5 minutes, compared with 66% of the richer 80%. The urban-rural divide is even more striking: the five-minute green space coverage rate is 73% in rural areas and as low as 64% in urban areas, exposing the conflict between urbanization and the distribution of public services.

### Case Study: Dundee

Dundee City, as a representative of an area of urban deprivation, has a 5-minute green spaces coverage rate of only 48%, which is much lower than that of rural Scotland (e.g. 85% in Dumfries and Galloway) and significantly behind the national average (66%). Such disparities not only reflect the inequitable distribution of green space resources, but also point to the problem of the neglect of disadvantaged neighborhoods in urban planning.



**Dundee**

percentage of Dundee's population that can reach green spaces within a 5 minute radius



**National  
average**

national average 5-minute green spaces coverage rate

We knew we needed to address the obvious disparity in access to green spaces between both urban and rural and economic class divisions.

# DIFFICULTIES OF DISADVANTAGED GROUPS

A further breakdown of the population data reveals that some groups face additional barriers:

older urban groups: higher green spaces accessibility for rural populations (73%) may inversely reveal the challenges of underutilization of green space faced by urban elderly.

Deprived urban communities: in Dundee City, for example, green space coverage is persistently below national levels and has not improved between 2013-2019. Such neighborhoods often lack well-maintained public green spaces, which increases the disconnection of the population from nature.

## TIME TRENDS

- Longitudinal data shows a significant lag in the rate of improvement in green space coverage nationally, there has been no significant change in the rate of accessibility of green space by region between 2013-2019 Change. This trend suggests that policies are not effectively addressing the needs of disadvantaged groups and that more targeted interventions are required.
- In order to develop effective solutions to these problems, our Snap & Save Peatlands programme aims to promote the widespread use of existing technologies for biodiversity conservation through a citizen science model of public engagement. We are committed to using data as a link to stimulate public interest in peatland and forest ecology, while providing scientific support for conservation programmes through real-time monitoring and feedback systems, and eventually achieving a deeper integration of nature conservation and community participation, so that every action can be turned into sustainable ecological value.

---

*Data reference: Scottish Government (2021). Distance to Green or Blue Space - Scottish Household Survey.*

## NEXT STEPS

The case of Dundee city (48% coverage), together with the time-trend data, suggests that addressing inequalities in green spaces need to prioritize and target key areas and groups. The next step needs to be to combine stakeholder analysis (e.g. schools, community organizations) to identify how barriers to participation can be broken down through multi-party collaboration. For example, the school can act as a hub to organize student participation in green space monitoring activities, while at the same time facilitating links between families and the local community to extend the coverage of the programme.

# THE PLAN

At present, the Department for Social Responsibility and Sustainability (2024a) promotes the use of iNaturalist amongst students to identify and record biodiversity on campus. This operates alongside and contributes data towards the "How green is your campus?" data mapping scheme that has been completed at Pollock Halls and King's Buildings. We must acknowledge that, while this has thus far been a successful biodiversity intervention, the equitability and effectiveness of the projects have been limited by the narrow focus on University of Edinburgh students and staff.

The Snap & Save Forest and Peatlands project is an extension of this campus-based biodiversity mapping. However, we propose a range of differentiating factors that aim to make Snap & Save a more effective and equitable enhancement of pre-existing programmes:

- **Creating partnerships, such as with local schools in Edinburgh, Perth, Stirling and surrounding areas; with university student groups and EUSA societies; and with Scouts Scotland and Girlguiding Scotland.**
- **Promoting accessibility by providing mobile devices and transportation bursaries for groups in deprived areas.**
- **Introducing gamification to encourage biodiversity education.**

We propose a costed 5-year plan that would implement the Snap & Save project effectively and ensure long-term sustainability – environmentally on-site, socially with local communities and organisations, and economically for your department.

---

snap & save  
group 10



# APP DESIGN

*saved 'snaps'*



*site map  
(OS maps)*





# TIMELINE

## with costs

### Year 1: Laying foundations

Aim: to create partnerships, promote the project both within and beyond the University of Edinburgh, and to create learning opportunities beyond site visits.

- To promote the use of iNaturalist amongst University of Edinburgh students.
- To make initial contact with prospective partner groups. This can be done at minimal cost and difficulty via email.
- Planning with Scouts Scotland to co-design biodiversity education sessions. The Youth and United Nations Global Alliance (YUNGA) offers a range of badges associated with sustainable development, one of which being the Biodiversity Challenge Badge (Food and Agriculture Organisation of the United Nations, 2025). This is accompanied by training packs, which could be adapted to be used at Forest and Peatland sites.
- Creating similar biodiversity education packages for schools that provide educational opportunities both during and outside of site visits. This could be two hour-long lessons to be completed before and after site visits, in order to prepare students and later debrief.
- To use the Department for Social Responsibility and Sustainability's (2024) pre-existing IT Reuse programme to source and refurbish 15 donated devices, to be used on-site.

**Costs: £0 (assuming staff and IT Reuse material costs to be pre-existing)**

---

snap & save  
group 10

## **Year 2: Pilot**

Aim: to run a limited number of educational partnerships (up to 300 children across 10 school groups) and scouting partnerships (one group of Rainbows, Brownies and Guides; of Beavers, Cubs and Scouts), and to begin provisions of mobile devices on-site

- Organise and run up to 16 site visits to be taught by schoolteachers and Scouting volunteers between September and July. This should be conducted at the Rullion Green Wood site, as it is the most local to the University of Edinburgh.
- Minimise risk to people and the environment by creating and distributing signage where relevant.
- Organise iNaturalist data into site-specific collections.
- Contact the next year's partnerships

**Costs: Signage (through the university) – up to £200 for a range of large 3D-printed signs.**  
**Travel bursaries - £129 for University of Edinburgh minibus hire per group, if required.**

## **Year 3: Expanding the community**

Aim: to double the number of educational and scouting partnerships while continuing to maintain the site.

- Organise and run up to 32 site visits across Rullion Green Wood and Drumbrae between September and July.
- Continue to organise iNaturalist data into site-specific collections
- Contact EUSA environmental societies (such as Dirty Weekenders and People and Planet) to arrange a schedule of regular society volunteering trips, to assist in land management as well as monitoring.

**Costs: £129 for University of Edinburgh minibus hire per group, if required.**  
**Signage if required**

---

snap & save  
group 10

# TIMELINE

## the app

### **Year 4: New challenges**

**Aim:** to develop a Snap & Save: Forest and Peatlands app that can be used in place of iNaturalist. This would make the project more cohesive with University of Edinburgh branding, and more sustainable: the project data could use iNaturalist identification technology, but integrate other features such as site-specific maps and health and safety instructions that reduce the need for single-use and signage printing. Additionally, the app should focus on gamification as an integral part of its design, encouraging younger users to build positive associations with biodiversity conservation. No additional steps should be taken other than continuing to provide 32 site visits and continuing partnerships within and beyond the University.

**Costs:** app development – based on NCS figures, app development cost over a 6-month period could reach £80,000 (National Careers Service, 2024). However, as the app's flagship feature will not need to be developed (iNaturalist allow their technology to be used for research and public-sector applications free of charge), development costs will be reduced. We propose that app development could be taken in-house by hiring interns to collaborate with staff over a 12-week summer period, offering students a £12.60 per hour Living Wage in line with socially sustainable policy. This would cost the department £6,048 per intern, while pre-employed staff could be offered a set fee of £10,000. For two members of staff and two interns, the total cost of app development could reach £32,096.



### **Year 5: Ensuring future equity**

Aim: to expand the project further to 48 site visits, and introduce visits to the Barvick Burn Wood site.

- Organise and run up to 48 site visits across all three sites
- Maintain signage and site development, supported by EUSA student society volunteers
- Establish annual reviews of learning materials for schools and scouting groups, and enquire into recommendations from partner schools and groups.

#### **Costs: Travel bursaries and signage.**

**Please note that the vast majority of under-22s in Scotland have Young Scot NECs, which entitle them to free bus travel. This would make all school students and most students eligible. It is therefore encouraged that school and scouting groups use public transport to visit the sites wherever possible, and that the travel bursary is a backstop measure.**

## IDENTIFYING STAKEHOLDERS

Given the people-focused nature of our initiative, carefully identifying and mapping out key stakeholders is essential for creating meaningful outcomes. For Snap & Save Peatlands to have long-term impact, it is crucial that we take an inclusive approach to stakeholder engagement, and so we aim to develop effective and sustainable strategies that fully incorporate the most relevant groups.

# SCHOOLS

Our primary stakeholders include school groups, particularly those from socioeconomically deprived areas in Stirling, Fife, and Edinburgh. By offering structured, long-term engagement, primarily through learning opportunities and curriculum improvements, we aim to ensure this vulnerable group is positioned at the forefront of our initiative. We also identify Scouts Scotland and similar youth organisations as valuable stakeholders, given their strong environmental focus and culture of ecological stewardship, which allows us to champion meaningful community action.

University students and staff form another core group, offering their technical expertise, volunteering capacity, and the potential for interdisciplinary collaboration. Additionally, university societies provide a platform for peer-led events and long-term outreach, helping us build a supportive and engaged network.

Finally, elderly members of the community, as highlighted in the Scottish Household Survey data, are important participants. They bring generational knowledge and local insights, while also benefiting from the wellbeing effects of environmental engagement.

**By mapping this diverse set of stakeholders, we can ensure our initiative appeals across demographics, whether by age, social group, or academic background, and remains compassionate and sensitive to those who may face barriers in accessibility and digital inclusion. By fostering a cross-stakeholder process, where different groups collaborate rather than act in isolation, we help address digital literacy challenges. For instance, elderly participants can be supported by younger users with greater digital fluency. This collaborative model ensures not only strong uptake of the app, but also a solution that is sustainable, equitable, and impactful across communities.**

---

snap & save  
group 10



# POTENTIAL FOR PARTNERSHIPS

To scale our impact, enhance accessibility, and reduce implementation costs, all of which ultimately ensure the long-term success of Snap & Save Peatlands, building strategic partnerships is vital. By collaborating with mission-aligned organisations already operating within the environmental, educational, and technological space, we can make our initiative not only effective and equitable, but also logistically and financially viable. These partnerships provide access to essential tools, outreach networks, and technical support, all of which are central to the successful implementation of our project.

## **iNaturalist**

We see strong partnership potential with iNaturalist, a free platform that allows users to record their encounters with plants and animals. Instead of building our own complex species identification system, there is potential to connect our app, which would maintain our design focused on education, rewards, and local engagement, to their tools and database. This would preserve the structured and equitable essence of Snap & Save Peatlands, whilst saving time and money on development. It would also link our users to a wider global community of citizen scientists.

## **Scouts Scotland**

A more local partnership we would be keen to develop, as previously mentioned as a key stakeholder, is with Scouts Scotland, the “largest mixed volunteer-led movement for young people in Scotland” (Scouts Scotland, 2024). With a programme that emphasises outdoor learning, environmental sustainability, and lifelong community involvement, Scouts Scotland aligns closely with our mission to create an inclusive and effective biodiversity intervention. By incorporating our app into their existing activities, we can foster a stronger, more educational connection between Scout groups and the natural environment. This partnership would be mutually beneficial. Scouts could engage in real-world citizen science while working towards badge achievements, such as the Environmental Conservation or Naturalist Activity badges, making their experience both meaningful and rewarding. Our app's gamified features, including digital badges and progress tracking, could further support engagement and help Scouts feel motivated and recognised..

**Ultimately, through these partnerships, Snap & Save Peatlands has the potential to become a lower-cost, higher-impact initiative, combining trusted technology, strong local networks, and a shared commitment to community-based environmental action.**



# ENSURING EQUITABILITY AND SUSTAINABILITY

This section focuses on how our group's proposal, Snap & Save Peatlands, supports equitable and sustainable approaches to biodiversity interventions, in line with the challenge question. Our group placed particular emphasis on widening participation, making the project accessible to a range of communities, and ensuring that its impact can continue over time. Within our context, equity involves removing barriers, supporting underrepresented groups, and creating meaningful opportunities for involvement. Sustainability, meanwhile, is about designing a project that is adaptable, realistic, and capable of long-term engagement beyond one-off visits. These aspects are essential to get right in order for the project to be effective and inclusive in practice. The next sections will outline how these principles have been embedded into the proposal.

To ensure the project is equitable, our group focused on inclusion, accessibility, and removing barriers that may prevent certain groups from participating. We plan to gather ongoing feedback from participants, particularly those from underrepresented communities, through short surveys and informal conversations. This will allow us to adapt both the app and site visits based on lived experiences, making sure the project reflects the needs of those engaging with it. We also recognised the need to reach beyond the Central Belt by building partnerships with rural and remote communities such as Knoydart and the Isle of Eigg. These areas are often excluded from biodiversity initiatives due to a lack of digital access and resources. To address this, we propose providing transport support or remote participation options, such as digital activities or virtual engagement, for those who cannot easily travel, including disabled individuals, carers, or those in isolated areas. In addition, we aim to work with schools in socioeconomically deprived areas to co-create longer-term learning activities. This moves beyond single visits and supports sustained engagement with biodiversity over time. Together, these actions aim to make the project fair, responsive, and inclusive of a wider range of voices and experiences.

# ENSURING EQUITABILITY AND SUSTAINABILITY

Sustainability in our proposal is embedded in both its structure and its long-term environmental purpose. The app is designed to support repeated use, allowing users to return to the same sites over time and contribute to an ongoing record of biodiversity in the area. This approach encourages lasting engagement while also generating data that can inform future conservation work. To ensure the project remains adaptable, regular feedback from users will be used to refine app features and activities, helping it respond to the evolving needs of participants without requiring large-scale changes. The use of existing university infrastructure, such as the IT Reuse scheme, also supports long-term delivery by making participation more accessible and reducing the need for new equipment or external platforms. From an environmental perspective, the focus on peatlands aligns the project with wider sustainability goals, supporting the protection of ecosystems that are essential to addressing biodiversity loss and climate change. Rather than acting as a one-off intervention, the proposal is structured to remain effective into the future, with a model that encourages continued involvement, minimal waste, and meaningful environmental impact.

**These equitable and sustainable features demonstrate how our proposal addresses the challenge of creating effective biodiversity interventions. By focusing on long-term relevance, environmental care, and inclusive access, the project offers a structure that can support lasting impact.**

# BENEFITS

1.

Integrated gamification (Werbach & Hunter, 2012) and behavioural economics (Thaler & Sunstein, 2008), the study of gamification modes (such as Ant Forest, eBird) provides strategies to motivate participation. To engage more people in this app and motivate them to continue to use it, gamification design, social interaction, reward mechanism, educational value and visualisation of actual impact need to be combined.

2.

## Core Functional Design

Based on GPS positioning and real-time image/sensor data, visualise the growth status of regional vegetation, dynamically displaying health indicators such as plant growth curves, carbon dioxide uptake and coverage. Construct three types of task system: daily punch card (watering and taking photos), challenge task (continuous monitoring of endangered plants), and team goal (improving community greening rate by 5%). Integrate AI image recognition technology to automatically analyse plant species and health parameters, and generate scientific cards (e.g., "Phacelia tree absorbs 10kg of CO<sub>2</sub>").

3.

## Incentive Mechanism

The points system is related to the level of users (junior gardener → forest guardian), which can be exchanged for environmental peripherals (seed bags / canvas bags), brand coupons and virtual rights (exclusive avatar frames). Establishment of a public welfare conversion mechanism (1000 points = 1 tree planted) and regular public announcement of ecological achievements (e.g. 10,000 trees planted). Setting up regional/global rankings, awarding certificates of honour and qualifications for offline activities.



# 4.

## Social ecology

supports the generation of environmental achievement posters (e.g. "Guard 5 square metres of forest today") and social sharing of planting diaries. Build UGC community, users can upload plant care pictures and articles, high quality content will be recommended on the home page and interactive points. Linkage with offline activities (tree planting festival/nature classroom), and connection to the government's "Urban Green Citizen" certification system.

# 5.

## Education System

Built-in plant encyclopaedia and environmental knowledge base, complete the study to unlock exclusive tasks. Invite experts to conduct live courses (endangered plant protection), and enhance environmental awareness through visual data (CO<sub>2</sub> absorption of a single tree). Designed intergenerational inheritance mechanism, the tree planting projects that users participate in will be used as "green heritage" to support parent-child nature education. Generate annual personalised environmental reports (emission reduction/area guarded) and push customised conservation suggestions.

# 6.

## Technical Implementation

Integrate satellite remote sensing, IoT sensors and mobile phone image data to develop a lightweight image recognition model (TensorFlow Lite). Establish a data alliance with environmental organisations, botanical gardens and university research teams, and introduce corporate CSR sponsorship funds.

# 7.

## Long-term Operation

Carry out time-limited activities (#Guardian of Ancient Trees Action#) in conjunction with World Environment Day and other nodes, and set up environmental protection ambassadors with community management rights. Trigger wake-up mechanism for dormant users (e.g., "Remind the sapling to blossom"). The plant health data submitted by users can directly assist ecologists in emergency response, crowdsourced data can provide long-term ecological monitoring support for scientific research organisations, and the endangered plant maps constructed by users can influence the government's policy on the designation of protected areas.

## SUMMARY

This app allows users to change from "passive bystanders" to "active creators", forming a closed loop between personal growth, social interaction, economic benefits and environmental contributions. Everyone's small actions can be aggregated into a world-changing force through technology - this is its greatest significance.

# CONCLUSION



Finally, we believe our proposal, the 'Snap & Save Peatlands' project, has the potential to make a meaningful and lasting impact on addressing the challenges of poor biodiversity engagement and the lack of consistent monitoring of the Peatlands' ecosystems, through a particular encouragement of accessible citizen science. As outlined, our app will aim to promote the use of existing technology amongst members of the public, in order to not only spread awareness of biodiversity conservation and provide monitoring for the programme, but to ensure the collection of real-time, on-the-ground data that can help guide future restoration and protection efforts.

As society continues to evolve and become increasingly dependent on mobile phone usage, we believe that tackling environmental challenges requires innovative, inclusive, and digitally driven approaches. To truly address an ecological crisis, it is essential to engage the wider public, not just as passive observers but as active contributors. The best way of doing this, is to embrace the new era of technology and use the widespread modern day phone usage to our advantage, turning everyday users into citizen scientists. Involving the public, and particularly underrepresented and marginalised communities, our app provides a cost-effective, collaborative and scalable way to monitor the health of our peatlands while contributing to ecological research and policymaking.

By combining this citizen science with digital accessibility, our project ensures biodiversity interventions remain data-driven, inclusive, and sustainable—empowering communities to engage in conservation both now and in the future, ensuring a long-term positive environmental impact.

snap & save  
*group 10*





# BIBLIOGRAPHY

Food and Agriculture Organisation of the United Nations (2025). Challenge Badges | YUNGA-UN. [online] Fao.org. Available at: <https://www.fao.org/yunga/resources/challenge-badges/en/> [Accessed 19 Apr. 2025].

Mercer, I., Lemon, A., Duncan, C., Brooker, E., Whyte, A., Mayhew, J., Thomson, J., Caldwell, J., McKain, S., Saunders, S., Sinclair, N. and Waddell, J. (2024). Protecting 30% of Scotland's Nature: Making '30 by 30' Meaningful. Perth, Scotland: Scottish Environment LINK, pp.1–20.

National Careers Service (2024). App developer | Explore careers. [online] GOV.UK. Available at: <https://nationalcareers.service.gov.uk/job-profiles/app-developer> [Accessed 22 Mar. 2025].

Ordnance Survey (2024). OS Data Hub. [online] osdatahub.os.uk. Available at: <https://osdatahub.os.uk/plans> [Accessed 24 Mar. 2025].

Scottish Government (2021). Distance to Green or Blue Space - Scottish Household Survey. [online] Available at: <https://statistics.gov.scot/data/green-or-blue-space-shs> [Accessed 24 Mar. 2025].

Scouts Scotland (2023). Home | Scouts Scotland. [online] Scouts Scotland. Available at: <https://scouts.scot/> [Accessed 19 Apr. 2025].

Thaler, R.H. and Sunstein, C.R. (2008). Nudge: Improving Decisions about Health, Wealth, and Happiness. London: Penguin Books.

University of Edinburgh Department for Social Responsibility and Sustainability (2024a). Data tracking: How biodiverse is our campus? [online] The University of Edinburgh. Available at: <https://sustainability.ed.ac.uk/operations/biodiversity/wild-campus/data> [Accessed 19 Apr. 2025].

University of Edinburgh Department for Social Responsibility and Sustainability (2024b). IT reuse. [online] The University of Edinburgh. Available at: <https://sustainability.ed.ac.uk/operations/zero-waste/it-reuse>.

Warbach, K. and Hunter, D. (2012). For The Win: How Game Thinking Can Revolutionise Your Business. Pennsylvania, PA, USA: Wharton Digital Press.