NPU STUDENT AMBASSADOR

TOOLKIT 2: BIODIVERSITY BASELINES

NATURE POSITIVE BY 2030

NATURE POSITIVE UNIVERSITIES

UNIVERSITY OF OXFORD

UN environment programme

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

January 2025

The Nature Positive Pledge: What does it mean?

Part of being a Student Ambassador is working and advocating for your university to sign the Nature Positive Pledge, if they haven't done so already. Information about which universities have already made the pledge can be found later in this Toolkit.

This is a pledge made by senior management of a university, such as a Vice Chancellor, Rector or Head of Sustainability, committing to start a Nature Positive journey. Your university doesn't have to have taken action already to take the Pledge, but must be willing to start the steps below.

Actions towards Nature Positive will require collaboration between many parts of an institution, such as grounds and estates teams, catering and gardening staff, academic experts, students and sustainability managers.

The Nature Positive Pledge: Steps of the Pledge

When a university makes a Pledge, they commit to the following steps to work towards becoming Nature Positive as an institution:

1	ASSESS THE BASELINE	Carry out a baseline of your institutional biodiversity impacts
2	SET SMART TARGETS	Specific, time limited, measurable targets for nature
3	ACT AND INFLUENCE	Bold actions for nature using the Conservation Hierarchy or 4Rs: Refrain, Reduce, Restore, Renew
4	REPORT ANNUALLY	Report transparently on your progress on your university website

The Pledge timeline involves university action and collaboration between staff, students and the public, so this may mean not all stages of the process are feasible for Student Ambassadors to undertake. We highlight areas where we believe Student Ambassadors can empower themselves and others through the Baseline and Actions stages of the Pledge, as well as taking other actions for nature.

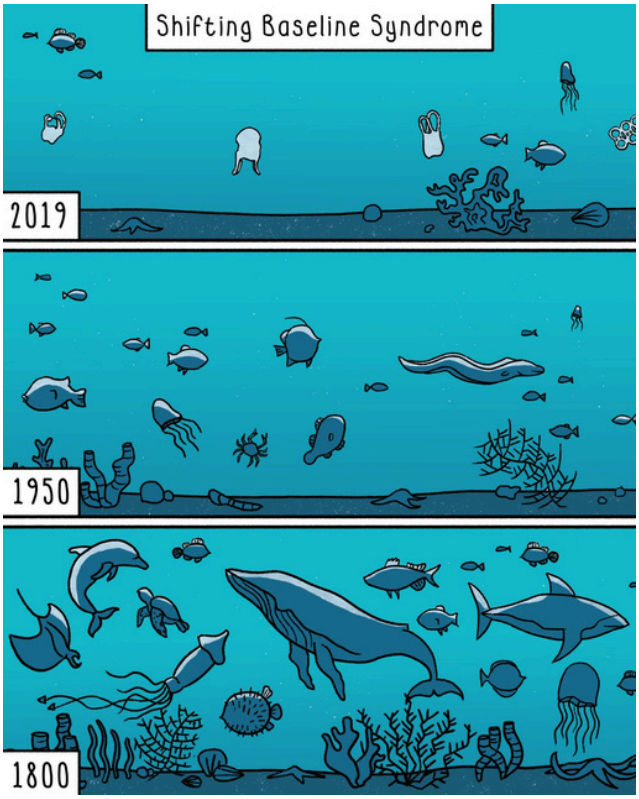
The Nature Positive Pledge: Who has already made the Pledge?

Since our launch at UN Biodiversity conference COP15 in Montreal, December 2022, we've received pledges from 154 universities across 45 countries, most recently from Monash University and Murdoch University in Australia, and King Abdullah University of Science and Technology (KAUST) in Saudi Arabia.

The members map on our website displays all different types of membership with Nature Positive Universities. Blue dots represent the 154 universities who have made the pledge (also available as a list on our website), orange circles show universities where there are students who have signed up to be a Student Ambassador with us for the 2024-25 cohort. Grey dots show our wider community of members.

1. Assess the baseline

To begin its nature positive journey, a university first needs to carry out a baseline of its biodiversity impacts. This is the first step of the Nature Positive Pledge. The university can choose its metrics and scope to measure its institutional impacts on biodiversity. This is unlikely to be something a student could approach alone, but it will be valuable for your university to have your support with this!



What is a biodiversity baseline?

A biodiversity baseline allows us to measure change and impact by recording the state of nature and activities which could affect it at a particular point in time. Setting a baseline can help inform action now and in the future. There are many ways to go about it, depending on resources and ambition.

Why is a baseline important?

The principle of measuring a baseline, is to work towards measurable biodiversity uplift, known as net positive outcomes, on our campus land, related to the resources we use, and using our influence as universities within teaching, research and community engagement.

1. Assess the baseline

WHAT ARE YOUR MOTIVATIONS?

There are many reasons to take action for nature and set a biodiversity baseline. It is important to think what you would like to do with this data, who will collect and maintain it, and more importantly what kinds of targets and actions it might lead to.

WHAT RESOURCES DO YOU HAVE?

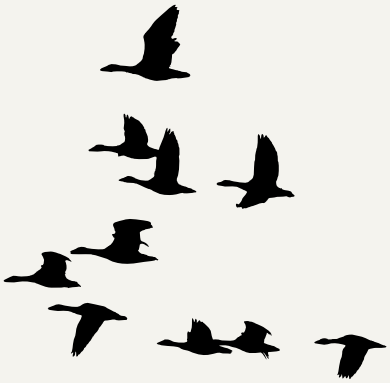
Ideally you and your university will work with an ecologist to help assess your site's biodiversity, and plan future interventions. It is worth seeing if there are species or habitat experts at your institution, or if you could make links with a local environmental NGO to help with this.

CAN YOU MAP THE HABITATS OF YOUR SITE?

You can create a habitat map of your site using an existing site-map, or you could create a new one using google maps. This can help identify the habitats and their condition, and identify opportunities for uplift. Photographs can be a useful way to record the current state of ecosystems.

WHAT DATA ALREADY EXISTS?

You can check which species have already been recorded on your site, either by staff, students or professional surveys, using public records or with citizen science platform such as **iNaturalist.** This may highlight particular species or ecosystems of concern or interest, and can provide a starting point for future surveys and monitoring.



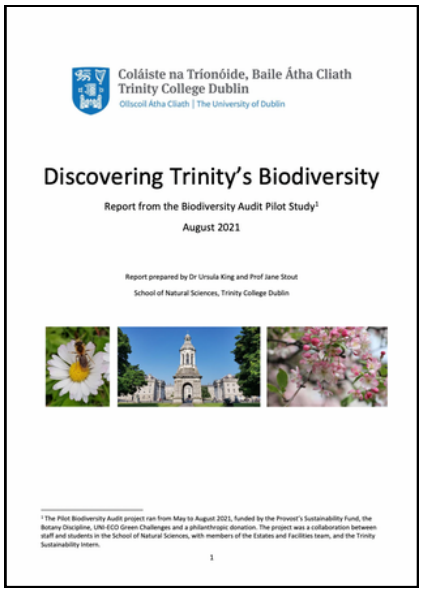
1. Assess the baseline

1a) Campus biodiversity survey

The first stage might be to complete a baseline study of the biodiversity present on campus and university-owned land. Depending on resources available, this may include comprehensive records of species and/or habitats present at this point in time. It may also focus on particular indicator species or use citizen science to match the available time and resources of the people carrying out this work. The scope is up to your institution. We provide further case studies in our BIODIVERSITY BASELINES guidance document, which can be accessed on the Student Resources page.

Case Study: Trinity College Dublin pilot biodiversity audit

A biodiversity audit was recently completed to document biodiversity across Trinity's 47-acre green campus in the city of Dublin. This was a collaboration between staff and students, Estates and Facilities teams, interns and volunteers. The study highlighted that in addition to iconic species such as foxes, trees and swifts, there is a wealth of hidden biodiversity in the form of plants, insects, fungi and other creatures.


Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Atha Cliath | The University of Dublin

Discovering Trinity's Biodiversity

Report from the Biodiversity Audit Pilot Study[1]

August 2021

Report prepared by Dr Ursula King and Prof Jane Stout
School of Natural Sciences, Trinity College Dublin

[1] The Pilot Biodiversity Audit project ran from May to August 2021, funded by the Provost's Sustainability Fund, the Botany Discipline, UNI-ECO Green Challenges and a philanthropic donation. The project was a collaboration between staff and students in the School of Natural Sciences, with members of the Estates and Facilities team, and the Trinity Sustainability Intern.

1


Credit: Trinity College Dublin

1. Assess the baseline

1a) Campus biodiversity survey

Case Study: 1000 species in 1000 days at Dawson College, Canada

Students from Dawson College in Canada ran a 1,000 Species in 1,000 Days initiative. Students, faculty and staff all contributed their talents and curiosity to get as many species identified on campus as possible with the count after one year being 820 species, with 3,916 total observations and 279 people contributing to the project. The goal of the initiative is to highlight biodiversity in an urban setting.

Case Study: Predator Monitoring and Management, University of Canterbury, New Zealand

Predator monitoring investigations were carried out in June 2022 to understand current predator presence. A predator trapping line was setup in July 2022 along one waterway to reduce predator numbers based on the results of the monitoring. Rat/mice traps, mustelid traps, and possum traps were all implemented on this line. This predator work was done with the support and input from the student body EnviroSOC, who helped with monitoring and installation of the line, and then continued support of clearing and maintaining the line. Since the beginning of the programme, 18 hedgehogs, 48 mice, 18 possums and 115 rats have been caught.

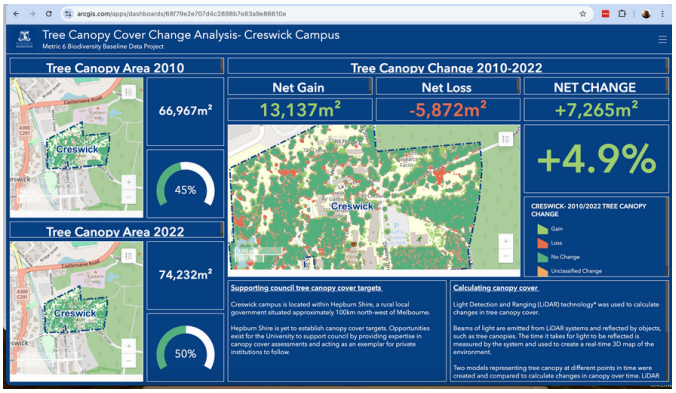
1. Assess the baseline

1a) Campus biodiversity survey

Case Study: University of Melbourne biodiversity baseline data project

University of Melbourne established an online dashboard for their university community tracking their progress towards their "No Net Loss" target for campus biodiversity. They record a range of biodiversity measures such as:

- Tree canopy cover area (m2)
- Plantable area (m2)
- No. plant species
- No. trees and tree species inventory
- No. fauna and fungi species
- No. of 'areas of significance'




Credit: Marc Dalmulderr

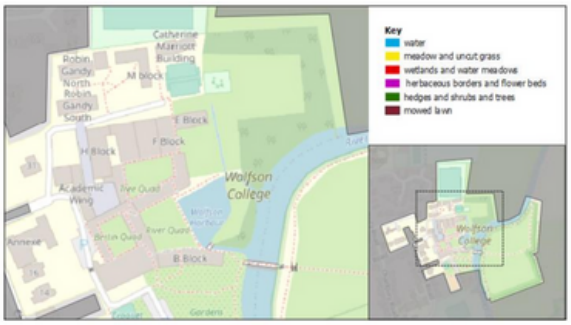


Figure 1- Example land cover map of Wolfson College

CATEGORY	COLOUR
Water	Blue
Mowed lawn	Brown
Meadow and uncut grass	Yellow
Wetlands and water meadows	Red
Herbaceous borders and flowerbeds	Pink
Hedges, shrubs, and trees	Green

Case Study: Campus habitat map, Conference of Colleges, University of Oxford

The Conference of Colleges Sustainability Working Group at the University of Oxford conducted a college biodiversity audit, which included a land cover audit. Staff used Land Cover maps and Google Earth images to record landcover types using a colour-coded key.

1. Assess the baseline

1b) Calculating the university's biodiversity footprint

Supply chain impacts can be estimated by first collecting university procurement data, such as paper and lab supplies, IT equipment, food and building materials. An example of how this can be done has been documented at the University of Oxford. Procurement data was converted into environmental impacts such as land and water use, greenhouse gas emissions, water and air pollution. This data was then converted into a proxy biodiversity measure to allow relative comparisons of impacts on biodiversity and identification of hotspots. The steps are shown below:

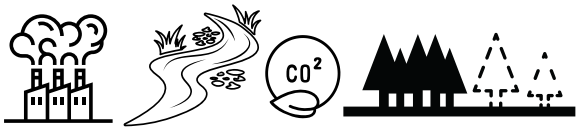
1

Choose the scope

2

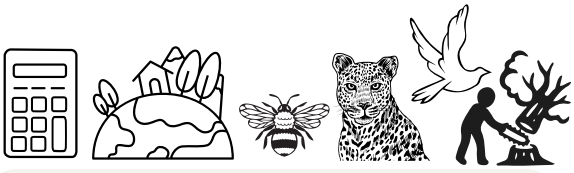
Collect the data

3



Calculate environmental impacts

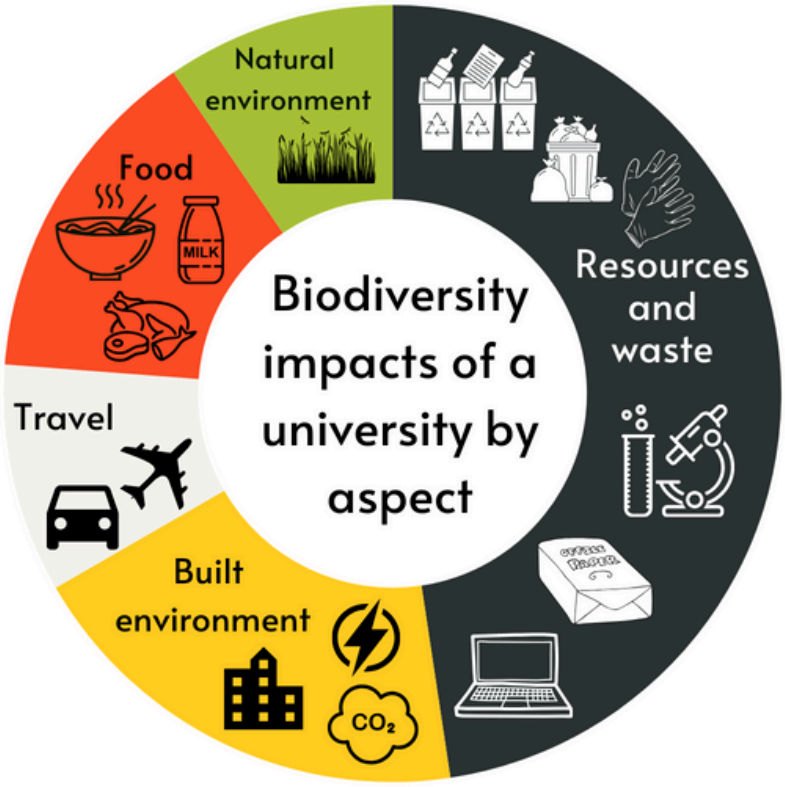
4



Calculate biodiversity impact

1. Assess the baseline

1b) Calculating the university's biodiversity footprint



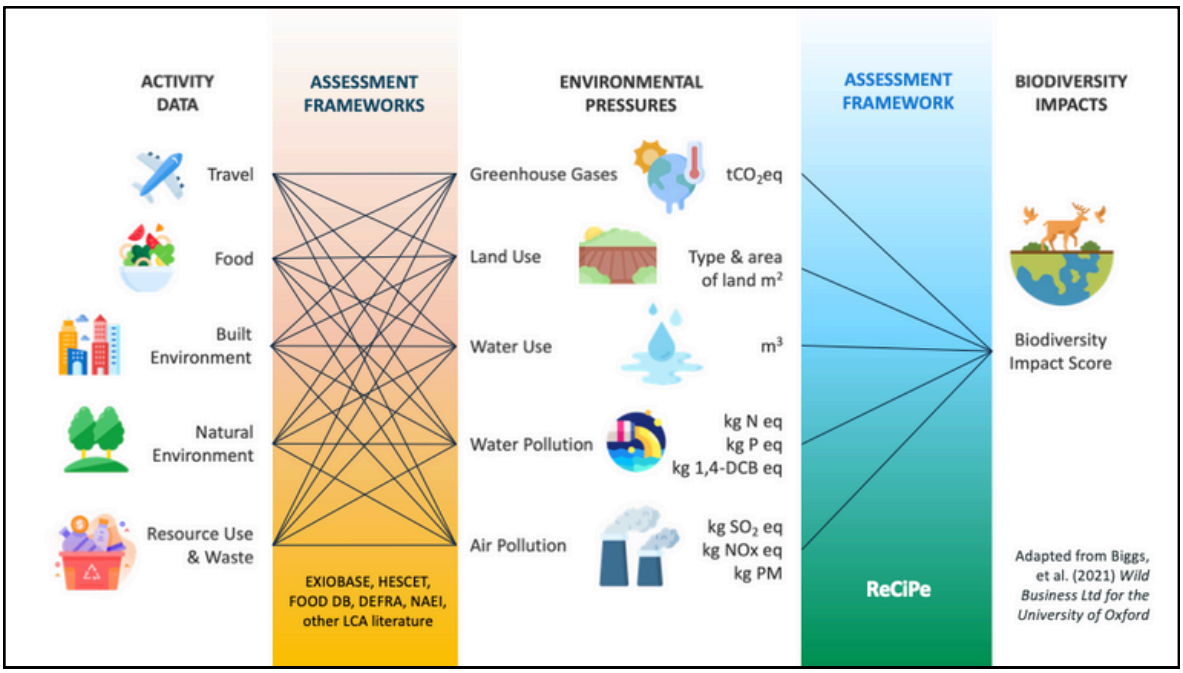
Natural environment	These include impacts to existing biodiversity present on site, grounds and facilities management relating to green spaces, including loss of habitat for new construction projects or biodiversity uplift activities such as creation of new habitats or nature areas.
Built environment	These include fuel, electricity and water use in university-owned and managed buildings and mining and transport of resources involved in construction and infrastructure.
Food	These include impacts related to growing and transporting all food consumed on site, eg in university canteens, cafeterias and departmental catering and conferences.
Resources and waste	These include impacts related to procurement of goods and services used in all university activities, such as IT equipment, server space, paper, laboratory equipment and supplies and furniture, at all stages from production to disposal.
Travel	These include impacts related to staff and student travel including commuting between home and work, conference and business travel.

1. Assess the baseline

1b) Calculating the university's biodiversity footprint

We have worked with students at University of British Colombia (Canada) and University of Tokyo (Japan) to begin carrying out biodiversity footprint assessments of their university food consumption. Other students at University of Hohenheim (Germany) and Jyvaskyla (Finland) have also contributed to institutional biodiversity footprint analyses.

Biodiversity footprinting is a time-intensive process and requires access to university procurement data, as well as support identifying suitable conversion factors, to turn activities (eg spend on IT equipment) into environmental pressures (eg land and water use, GHG emissions), and biodiversity impact estimates. However we are keen to support students to assist with biodiversity footprinting where possible and will be developing further training for students in the future in this area.

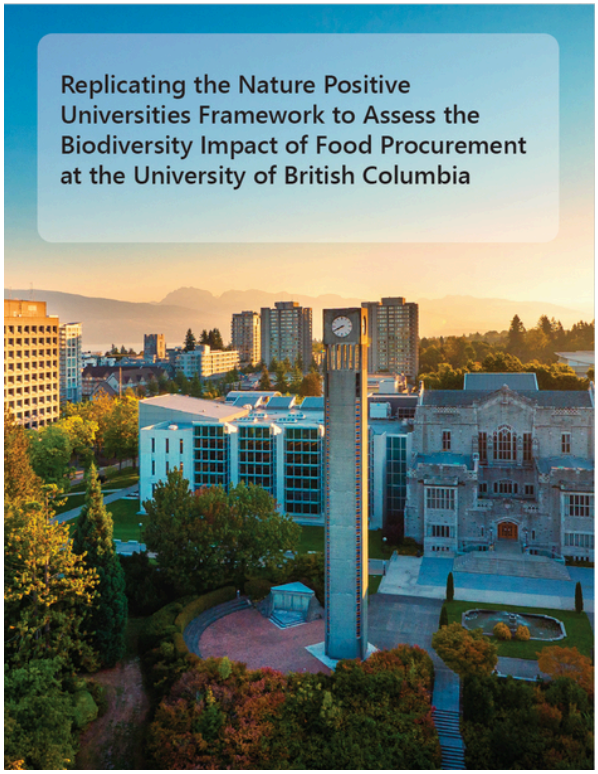


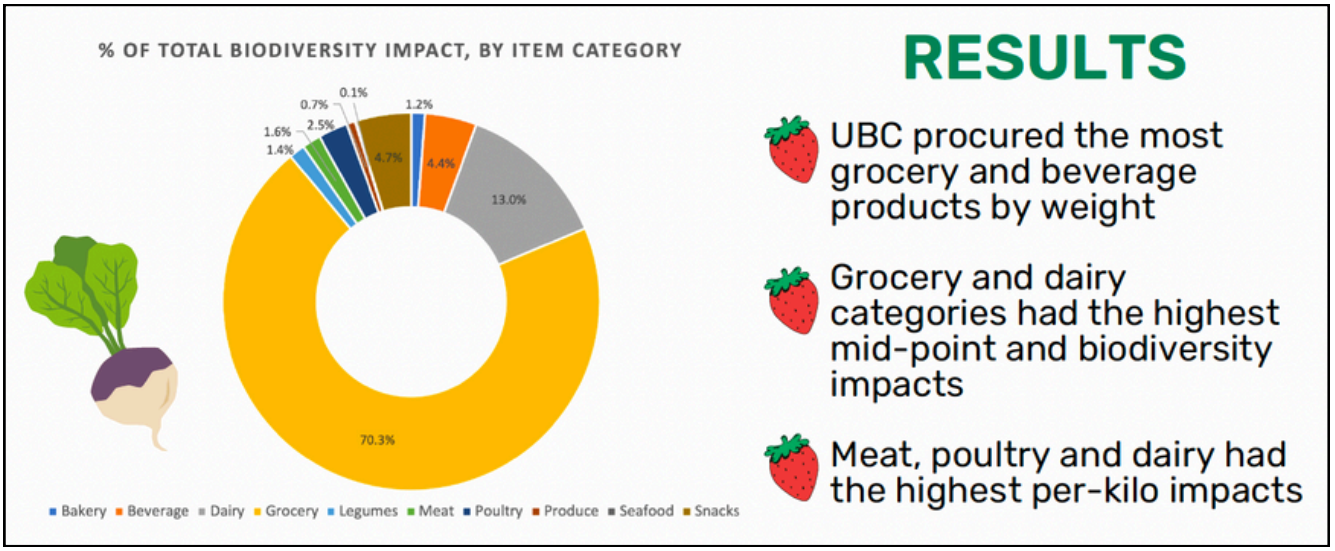
1. Assess the baseline

1b) Calculating the university's biodiversity footprint

Case Study: University of British Colombia, Canada

Research students at University of British Colombia (UBC) assessed the environmental impacts of their food procurement using Oxford's conceptual framework, looking specifically at the GHG emissions, land and water use, air and water pollution of food procured by UBC Food Services (UBCFS) outlets (including dining halls, restaurants, retail and catering) between January and December 2022. They used the impacts to estimate the extent of biodiversity loss associated with food procurement and identify areas for reduction of negative impacts.





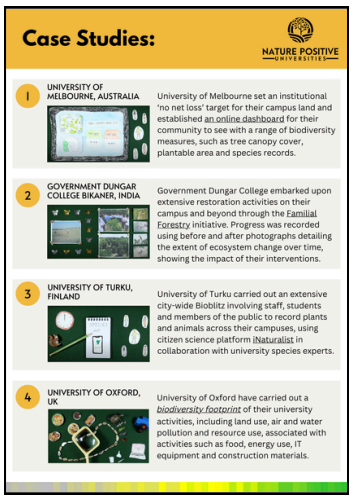
Final report available here:
https://www.naturepositiveuniversities.net/wpcontent/uploads/2024/04/NPU_UBC_FinalReport.pdf

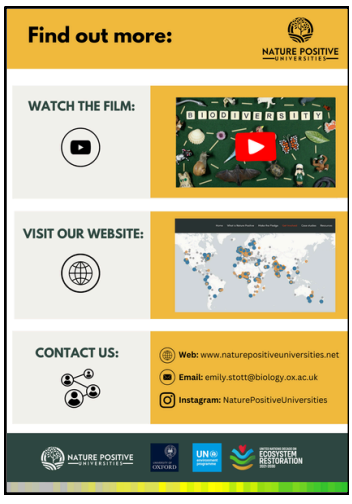
1. Assess the baseline

Some of the case studies in this Toolkit were also featured in our short animated film, which we encourage you to watch. You can find it on our Instagram or YouTube channels. Please do spread the word for others at your institutions and in your networks to watch it!

There is also an accompanying guidance document which you can find on our website at:

www.naturepositiveuniversities.net/student-resources





2. Set SMART targets

After a university has calculated its baseline, it should set SMART targets – specific, time limited, measurable targets for nature. Some universities set an overall target first, then use their baseline and data collection to refine specific actions and targets.

- Targets must be specific, measurable, attainable, relevant and time bound, but their scope is up to the university.
- A great time to set these is when writing or reviewing the university's sustainability or biodiversity strategy.
- Ambitious targets can be institution-wide, encompassing campus buildings, grounds, operations and supply chains.
- Depending on what is acceptable to your university community, targets could also be just for specific aspects, such as "Biodiversity net gain for food purchasing by 2035" or "No net loss of forests associated with university paper procurement by 2025".
- Wide consultation with different stakeholders is key to gauging ambition and achieving buy-in for your targets.

Students can also use these principles to plan their own projects, and review progress, holding themselves to account, and reflecting on challenges and successes.

You can read more about SMART targets here, but see the next page for what they involve.

S M A R T

SPECIFIC

What exactly are you trying to achieve?

State what you'll do

Use action words

MEASURABLE

How will you know when you've achieved it?

Provide a way to evaluate

Use metrics or data targets

ATTAINABLE

Is it genuinely possible to achieve it?

Within your scope

Possible to accomplish

RELEVANT

Does it contribute to your organisation or institution?

Ensure targets improve the organisation or institution

TIME-BASED

When do you want to achieve this by?

State when you'll get it done

Be specific on date or timeframe

3. Actions and Influence

The Actions and Influence stage can include all the actions and activities that universities take for nature, including on their grounds, operations, catering, investment decisions, outreach and public-facing events and initiatives, using the framework for action from the Conservation Hierarchy (Refrain, Reduce, Restore, Renew). We will cover this in more detail in our next workshop.

This stage is the easiest for Ambassadors to get involved with, and can involve action at many levels, as an individual, as part of a student group, or in collaboration with university staff.

Remember to consider your capacity as a student versus the university institution as a whole; don't put too much on yourself. Acknowledge your own limits and where the university should support you or take over.

3. Actions and Influence

Students recording plants on campus at Independent University Bangladesh, Bangladesh

Students, staff, faculty and volunteers helping restore the ecosystem of the only natural creek on campus at University of California, Los Angeles (UCLA), United States

Planting an urban pocket forest at Government College University Lahore, Pakistan

Campus fauna crossings and wildlife corridors at University of Campinas, Brazil

Architecture and Design students creating a series of species hotels to help restore habitats for local wildlife at University of Tasmania, Australia

Mangrove restoration led by staff and students at University of Ajman, United Arab Emirates

4. Reporting

We ask universities to commit to transparent reporting of progress on an annual basis, highlighting current progress towards reducing impacts on nature according to the aspects of the pledge: baseline, targets and actions.

The requirements are light-touch, similar to the information required in the initial Pledge form, with brief updates on each aspect and relevant URLs. More detailed submissions are also welcome, documenting your university's Nature Positive journey and links to any reports and publications we can share.

Reporting is suggested to be done by your university by a committee or paid sustainability/biodiversity staff member. However, we encourage students to get involved with the reporting and to make sure student voices and contributions are acknowledged in the reporting process.

Ambassador Actions:

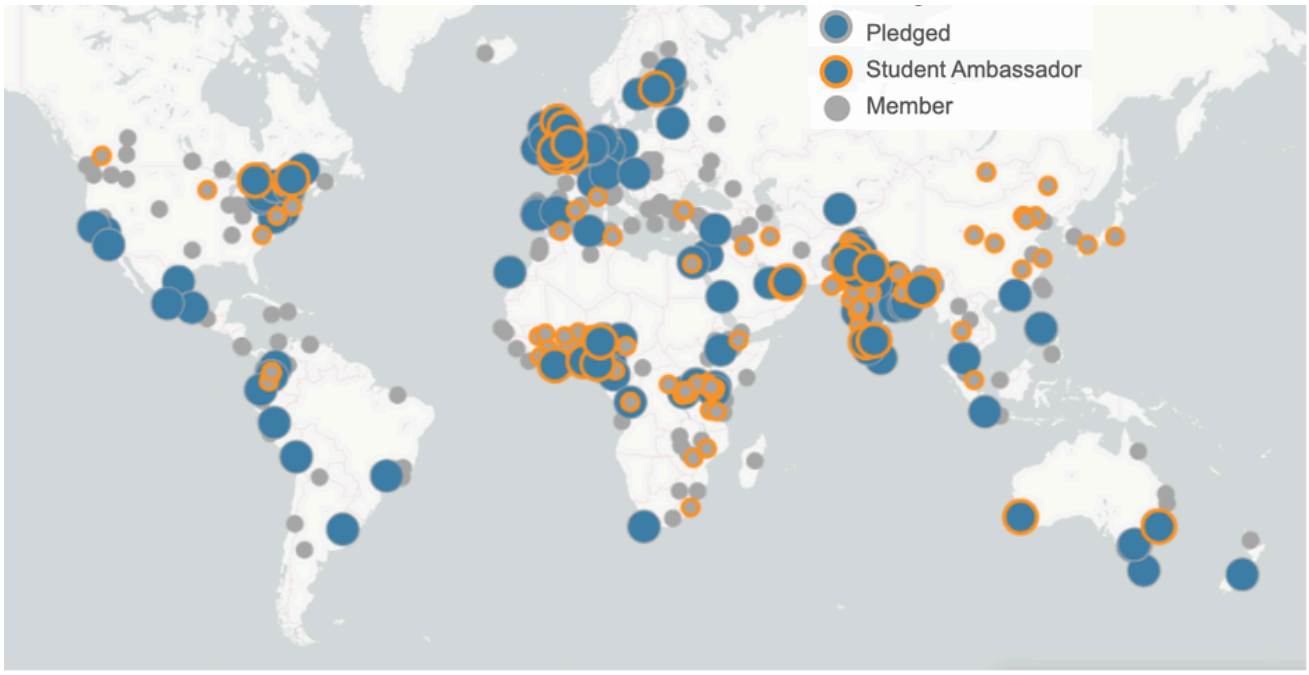
As a Nature Positive Universities Ambassador, we want you to help make Nature Positive change in your university. The actions in our toolkits are designed to provide inspiration for what you might like to do in your role, but we encourage you to take the approach that you think will work best.

This second Toolkit on the theme of "Biodiversity Baselines" contains five suggested actions, which we'd love you to work towards over the next month. We ask everyone to complete actions 1-3, and 4 and 5 are optional tasks, depending on interest and your time and resources. The following pages contain more detail of these tasks.

Workshop 2 Actions:

1. **Find out if your university has pledged and connect with relevant staff to investigate interest in making a pledge.**
2. **iNaturalist actions:**
    a. **Register on iNaturalist and start recording wildlife**
    b. **Join the iNaturalist Student Ambassador group**
    c. **Speak to your university about joining the NPU-Campus Biodiversity Network (you will need a campus map)**
3. **Take campus photos and think about interventions**
4. **Take part in the City Nature Challenge (25-28th April)**
5. **Plan a Bioblitz for your campus or nearby area**

1 Find out if your university has pledged and connect with staff



Check our members map and spreadsheet on our website to see if your university has made a pledge

If it has not, we are happy to help support you to work towards a pledge at your institution. We can supply a letter of invitation, or arrange a video call with a staff member.

If your university has made a pledge, let us know if you would like to be connected with your university contact to see if you can work together.

If your university has carried out existing ecological surveys or has projects focusing on biodiversity, there may be ways to get involved as a volunteer, whatever your subject area.

2a Register on iNaturalist and start recording wildlife

iNaturalist is a free app and website that allows you to identify and record species you see around you, using pictures taken on your phone or camera. Once uploaded, they are identified by the app and verified by members of the community. This approach is known as citizen science.

How to use iNaturalist to make observations:

An observation records an encounter with an individual organism at a particular time and location. This includes encounters with signs of organisms like tracks, nests, or things that just died. When you make an observation, you'll record:

Who you are
You'll need to make an **iNaturalist account** and please only post your own personal observations

What you saw
Choose a group of organisms like **butterflies** or better yet a specific organism like the **Monarch butterfly**. If you provide evidence you can leave this blank and the **community can help**

Where you saw it
Record both the coordinates of the encounter as well as their accuracy. You can obscure the location from the public

When you saw it
Record the date of your encounter, not the date you post it to iNaturalist

Evidence of what you saw
By including evidence like a **photo or sound**, the community can help add, improve, or confirm the identification of the organism you encountered. Help the community by taking clear well framed photos, by including multiple photos from different angles

Your observations don't need to include all of these parts, but they do in order to become research quality observations for science. Remember, you should make separate observations for each separate organism you encounter. If you observed something that is not wild, like a garden plant or a lion in the zoo, make sure to mark it as captive/cultivated to prevent it from becoming research quality.

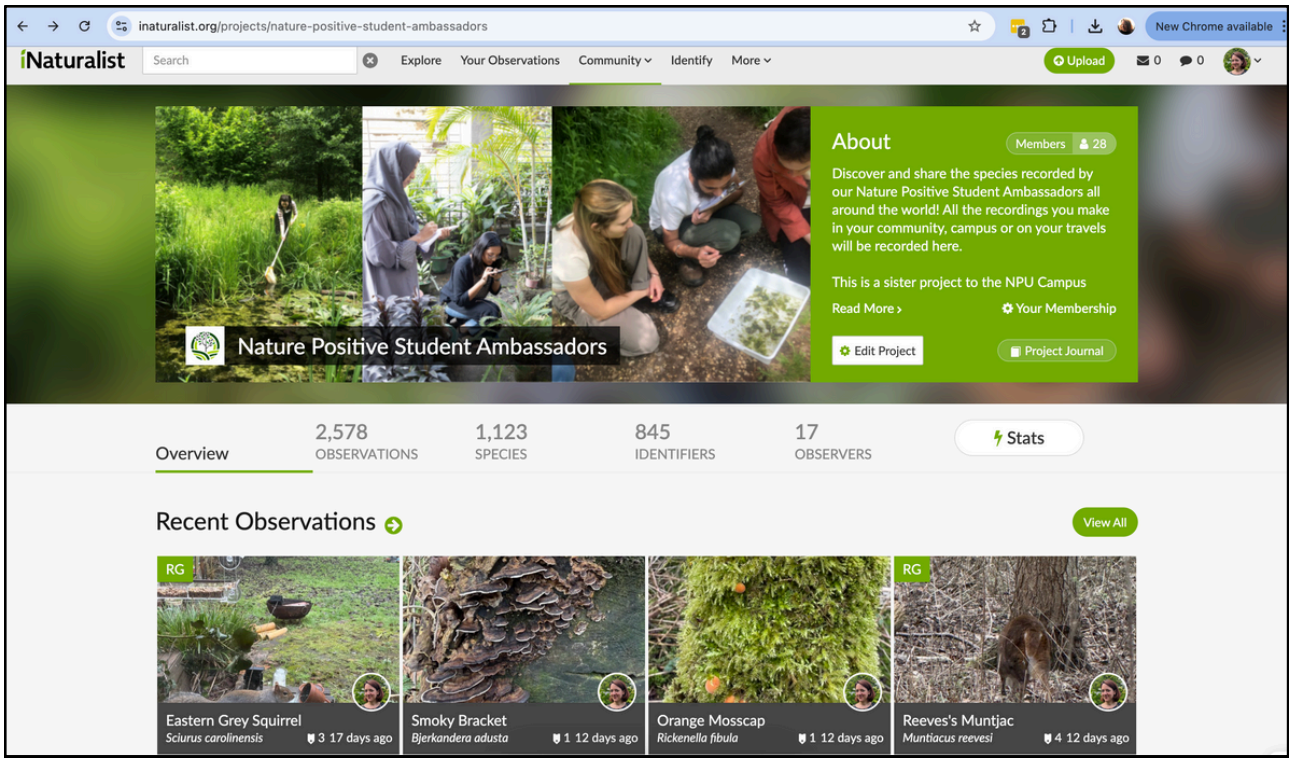
2b Join the NPU Student Ambassador group

Join the Student Ambassadors' iNaturalist group

Share your iNaturalist ID in Workbook Form 2, then we will add you to the Student Ambassadors' iNaturalist group to share your observations.

You can record wild flora and fauna anywhere you are for this group- it does not only have to be on campus! You will be able to see the observations of members of our community from all over the world.

Please don't include observations of pets or humans, and make sure to take a few photos from different angles.



2c Speak to your university about joining the NPU-Campus Biodiversity Network

Founded by Vanier College in Montréal, Québec, and launched in 2022, the Campus Biodiversity Network aims to promote campus greenspace observation and protection by using iNaturalist, eBird and eButterfly.

The Campus Biodiversity Network has now partnered with NPU and encourages students, staff, and faculty at educational institutions in Montreal and beyond to champion their institutions' green spaces and connect with others through citizen-science observations.

By creating a project for your university under the Campus Biodiversity Network, all the species recorded within your campus boundaries will be collated together, allowing you (and the rest of the world) to see what biodiversity is found on your campus. This can show us the kind of nature that exists on your campus, as one type of baseline for your university's campus biodiversity.

NATURE POSITIVE UNIVERSITIES

campus biodiversity network

Watch this NPU Student Ambassador workshop from 2023 to find out more!

2c Speak to your university about joining the NPU-Campus Biodiversity Network

Steps to setting up an iNaturalist campus project (will need cooperation from university staff)

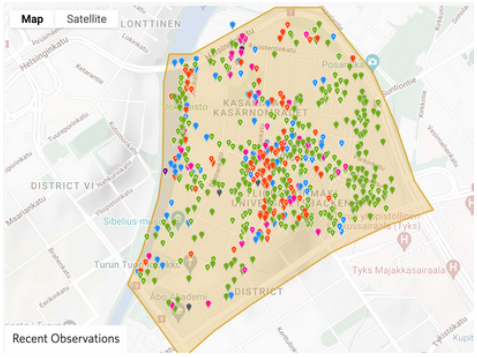
1. Make an iNaturalist account and start recording species you see on campus.

2. Find out if there is already an iNaturalist project for your campus.

3. If not, find out if there is a map (KML format) of your campus land, or make one yourself using our instructions.

4. Consider making a digital banner for your university. This needs to be 760 x 320 pixels and can include photos or artwork.

5. Check with your university if they're happy to share the university logo and complete the form to join.



3 Take campus photos and think about interventions

A biodiversity baseline doesn't have to be complicated or involve specialist ecological knowledge. As featured in our short film with the example of Government Dungar College, India, taking before and after photos is a really powerful way to document the state of the environment and specific habitats at a point in time, and to record progress and changes visually.

We would like you to take some photos to document green or natural areas of your campus grounds and their current condition. If you do not have much green space, you could focus on areas of buildings that could be enhanced for wildlife, or natural areas close to your university. You might choose to focus on degraded areas and think about how these could be enhanced for people and nature.

You can record your observations and ideas in your workbook and upload your photos. We will follow up with ideas for posting on social media too!

BEFORE
Non-native planting at University of Konstanz, Germany

AFTER
Mix of native flowers and shrubs to attract pollinators and provide variety of habitats

3 Take campus photos and think about interventions

Case Study: Government Dungar College, Bikaner (India)

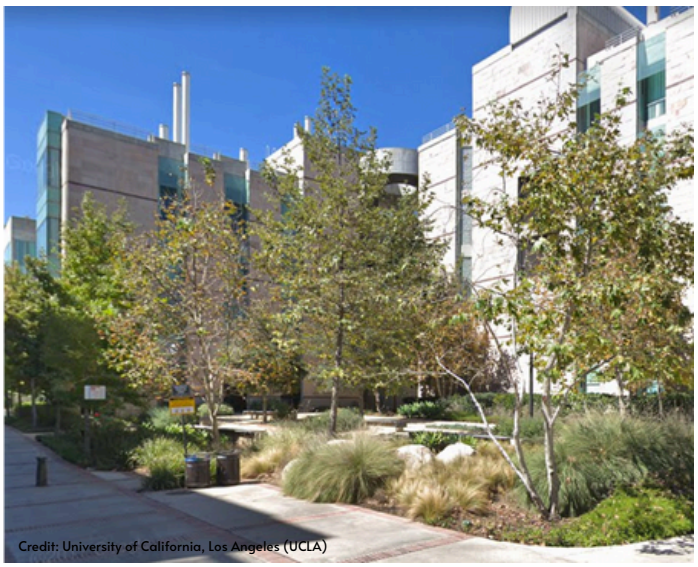
Government Dungar College embarked upon extensive restoration activities on their campus and beyond through the Familial Forestry initiative. Progress was recorded using before and after photographs detailing the extent of ecosystem change over time, showing the impact of their interventions.

Screenshot from the NPU Biodiversity Baselines animated film, accessible here: https://youtu.be/7S5je8PwbZ4

Student Ambassador Avani Jyani participating in restoration activities with her family and community through Familial Forestry.

Before and after pictures of public land degraded by illegal mining, and restored by the Familial Forestry initiative.

3 Take campus photos and think about interventions



Rethinking lawn areas to add shade, and provide habitats for a wider variety of species at University of California, Los Angeles (UCLA).

The roof in August 2020 and 2022

Case Study: University of Konstanz, Germany

In collaboration with their Biology Department, University of Konstanz have been converting gravel roofs to green biodiversity roofs, planting multiple, native species. A biodiversity experiment was set up to compare different native plant species, adapted to relatively dry conditions and test whether it's helpful to start with high biodiversity to increase cover of on the green roof and prevent unwanted species. These aerial photos document before and after the experiments.

You can watch NPU Webinar 3 to find out more about some of these Case Studies.

OPTIONAL!

4

Join the City Nature Challenge (iNaturalist) April 25-28th 2025

City Nature Challenge (CNC) is a four-day Bioblitz style competition where cities across the world compete to see who can make the most observations of nature, find the most species and engage the most people.

The challenge started in 2016 as a competition between Los Angeles and San Francisco, and has since grown into an international event, motivating people around the world to find and document wildlife in their own cities.

City Nature Challenge is a great opportunity to plan a Bioblitz on your campus for these same days, and help count towards your city's efforts recording biodiversity. It could also be a chance to coordinate with others in your city to invite participation and wider community engagement with your event.

How to join the City Nature Challenge

More information about the City Nature Challenge and how to get involved can be found the City Nature Challenge website. The list of participating cities and a link to the global project will be posted on the website in March 2025.

OPTIONAL!

5

Plan a Bioblitz on your campus or nearby site

A BioBlitz is an event in which a group of individuals aim to record as many species of plants, animals and fungi as possible in a location, over a defined time period (usually 24 hours). It's an informal and fun way to create a snapshot of the biodiversity that can be found on your campus.

As well as providing a good idea of species richness on campus grounds, a BioBlitz is a great opportunity for participants to learn together and share their expertise and enthusiasm for nature. It usually involves a group of scientists, students, naturalists and members of the public working together. This is a great way of breaking down barriers to engagement with science and raising awareness of the role of biological recording, and gives the public an opportunity to contribute to a genuine scientific survey.

Ambassador Case study: Oxford University Nature Conservation Society, UK

"For the past three years, we have been running our annual society BioBlitz for students and staff of the University as well as wider residents of Oxford City."

To consider...

The site:

Choose a site and secure permissions to access and survey – this might involve checking any conservation designations in the survey area that may limit the activities which can be undertaken or obtaining permission from the landowner.

Time of year:

Biodiversity varies hugely across the year and this can strongly affect your BioBlitz findings.

Promotion:

The more people involved in your BioBlitz, the more records you'll get and the more successful it will be. Promote the event through different channels, including social media, email, posters, and word of mouth.

Equipment:

You might need nets and containers for terrestrial invertebrates or aquatic life. Universities often have equipment to borrow, so do ask!

Species records:

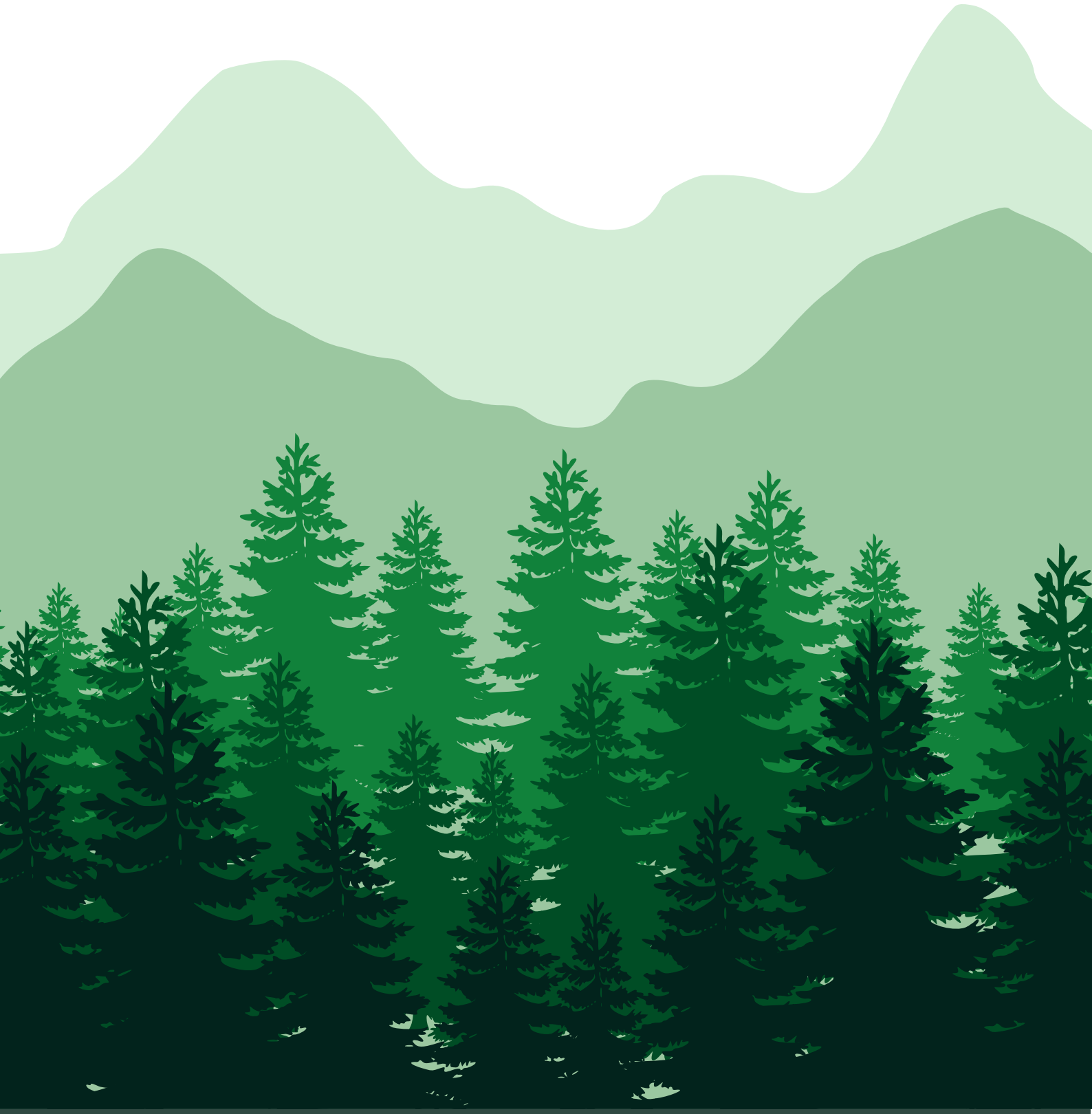
Species records are the ultimate goal for your BioBlitz. You can either make your own recording sheets to give out to participants on the day, or preferably use a mobile app to save paper. All species records are important, whether common or rare, as they allow you to build a biodiversity map of your local area, and also compare how your university is doing compared to others or where it can improve. You should also always try and send your records to the local environmental records centre (in the UK) or local environmental charity as it might be useful to them.

Expert advice:

Universities have many academics and biology experts which are passionate about their research and may be happy to volunteer their time for a few hours – ask them if they'll come along and help you ID! If not, use ID books and mobile apps such as iNaturalist and iRecord.

Further guidance and information:

- A Guide to Running a BioBlitz from the UK Natural History Museum
- Download the iRecord app
- Watch back a presentation given by NPU Student Ambassador Aliisa Wahlsten from University of Turku at a Student Ambassador workshop back in 2023
- Visit the iNaturalist website



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