Urban Nature Atlas: Methodology approach
### Table of Contents

**Nature-based Solutions Concept and City Selection** .................................................................................. 3  
How the project defined nature-based solutions (NBS) ............................................................................... 3  
How the cities included in the Urban Nature Atlas were selected ............................................................... 3  

**Data Collection Process** .......................................................................................................................... 4  
How the data was collected .......................................................................................................................... 4  
What were the requirements for selecting the nature-based solutions for the database? ......................... 4  
What was the method applied to the data collection process? .................................................................... 4  
What type of data was collected? .................................................................................................................. 5  
How the sustainability challenges were identified ....................................................................................... 5  
How the urban setting or type of nature-based solutions were identified .................................................. 6  
Which approach was used for the categorization of the ecosystem services? ........................................... 6  
How the addressed challenges, the provided ecosystem services or the project beneficiaries were identified .................................................................................................................................. 6  

**Data Validation** ......................................................................................................................................... 6  
Was the data collected subject to a quality control process? .................................................................... 6  
Limitations of the data collection process and the applied methodology .................................................. 7  

**Next Steps** ............................................................................................................................................... 7  
Is an update to the collected data foreseen? ................................................................................................. 7  
How the collected data can be used for analysis ......................................................................................... 7
Nature-based Solutions Concept and City Selection

How the project defined nature-based solutions (NBS)

According to the NATURVATION project, nature-based solutions are deliberate interventions that can be inspired or supported by nature in addressing urban challenges, such as climate change mitigation, water management, land-use and urban development (Bulkeley et al., 2017).

Projects included in the Urban Nature Atlas had to fulfil the following criteria:

1. Address various urban societal challenges (e.g. climate mitigation, water management, coastal protection, human health and recreation, social justice);
2. Have ‘function-enhancing’ features, that change or enhance the function of an area/structure;
3. Use nature as an inspiration to address an urban problem was either a physical intervention or a discursive one.

How the cities included in the Urban Nature Atlas were selected

A systematic approach was applied to select the 94 cities included in the survey, in addition to the project’s 6 partner cities (Barcelona, Győr, Leipzig, Newcastle, Malmö, and Utrecht). The aim was to select a city sample that ultimately represents the varied urban and environmental conditions across Europe and which has a broad geographical distribution. Figure 1 provides an overview of the 100 cities included in the NBS database.

Applied indicators for the city selection included demographics, city size, unemployment, proportion of green space, access to green areas in Europe's cities, climate risk and vulnerability. By choosing a diverse sample of cities, the project aimed to analyse which types of nature-based solutions are being implemented, how they are being delivered and the issues they are seeking to address, what is their type, form, function and distribution.

Figure 1: Cities included in the NBS Database
Data Collection Process

How the data was collected

The database was developed between January and August 2017. As a first task (January to March 2017), the structure and attributes were developed and organized in a questionnaire format by the Central European University (CEU) and Ecologic Institute teams. The questionnaire was then tested in the NATURVATION partner cities and the database concept was finalized in April 2017. The technical design and testing of the web-based questionnaire took place in May 2017.

The database was populated with data collected by 20 interns, drawn from the Master’s Programmes of CEU, Lund University and Utrecht University from June to Mid-August of 2017. Prior to the data collection, all interns took part in a one-day training based on the training manual developed by the CEU team. Data collection was supervised by the respective institutions for their own interns and had to pass a quality control by the project team at CEU. Data collection was completed by the end of August 2017. Data analysis and the development of the public database platform was launched in September 2017.

By August of 2017, in total 997 questionnaires had been submitted and 976 processed for further analysis. In order to expand the Urban Nature Atlas to 1000 projects, additional nature-based solutions were included between July and September 2018 (please see “Next Steps”). During this additional data collection, attention has been given to identify projects in cities with only 8-9 NBS in the Urban Nature Atlas and including nature-based solutions studied in the other Naturvation work streams (https://naturvation.eu/cities).

What were the requirements for selecting the nature-based solutions for the database?

The data collectors were requested to identify up to 10 NBS interventions per city, while aiming for a diversity of the selected interventions in terms of the urban setting where they take place, the sustainability challenges they address or the governance arrangements they employ. The selected projects had to be in line with the Naturvation definition of nature-based solutions (see section “Nature-based Solutions Concept and City Selection”).

What was the method applied to the data collection process?

The analysis of the identified nature-based solutions was based on secondary sources (e.g. project reports and other project documents, websites, news articles, research articles, studies and blog posts). The collected data was examined using discourse analysis. The intention was not simply to look for terms (e.g. nature-based solutions, green or blue infrastructure) but to search for patterns of
discourse connected to those terms. Nevertheless, all answers reported in the database are based, without exception, on factual information with a reference.

What type of data was collected?
The collected data was submitted in a questionnaire format that contained seven sections and covered the key characteristics of urban NBS, governance arrangements that enable their implementation, direct beneficiaries and impacts, and the type of innovation of different NBS domains, among others. Details of the questionnaire are summarised in Table 1.

<table>
<thead>
<tr>
<th>Section 1. General Information</th>
<th>(i) Location and description of the project in which basic information about the intervention is requested such as the name of the project, country and city of origin, short description, (ii) contact information and (iii) timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 2. Objectives</td>
<td>Goals of the intervention, quantitative targets and underlying monitoring indicators, implementation activities and sustainability challenges addressed.</td>
</tr>
<tr>
<td>Section 3. Key characteristics</td>
<td>(i) Ecological domain(s) where the NBS way is being implemented, (ii) ecosystem services provided, (iii) spatial scale and (iv) primary beneficiaries. The NBS ecological domains and scale were defined by the project, while the classification of ecosystem services used the TEEB classification system.</td>
</tr>
<tr>
<td>Section 4. Governance and financing</td>
<td>Governance arrangements, including (i) key actors and stakeholders involved in the planning and implementation of NBS, participatory methods used; (ii) policy drivers of the NBS intervention at EU, national and local levels; (iii) enablers of the project e.g., strategies, research projects, subsidies; (iv) financing aspects, such as the sources of funding, total cost and types of funding used.</td>
</tr>
<tr>
<td>Section 5. Innovation</td>
<td>Innovation potential with technological and/or social components, novelty level and replicability or transferability potential.</td>
</tr>
<tr>
<td>Section 6. Evaluating and Learning</td>
<td>(i) Impacts of the NBS intervention (environmental, social and economic) and which indicators were used to assess them; the (ii) evidence for use of the assessment; (iii) presence of impact assessment mechanisms and (iv) if there was citizen involvement in the assessment/evaluation and analysis</td>
</tr>
<tr>
<td>Section 7. Sources</td>
<td>References and links to source materials used.</td>
</tr>
</tbody>
</table>

Table 1. Type of data collected in the questionnaire.

How the sustainability challenges were identified
The NATURVATION project identified twelve challenges to which nature-base solutions can respond. Besides sustainable urban development, nature-based solutions can also address wider global development challenges, as defined by the UN Sustainable Development Goals (SDGs). The sustainability challenges, which were addressed by the studied nature-based solutions, were identified based on the specified project goals or implementation activities. The challenges could be chosen if the project description or a document presenting the project mentioned an objective that
aimed to address a specific challenge. For example, if an urban park aimed to increase the quality of life and provide green recreational areas, we could conclude that the intervention is addressing the challenge of “health and well-being (in line with the SDG3). Search words for these challenges, in line with the relevant literature and the SDGs were provided to the data collectors in a Data Collection Guidance Manual.

**How the urban setting or type of nature-based solutions were identified**

In most cases, the task of identifying the urban setting of the nature-based solution was rather straightforward. For example, “Jardim das Oliveiras”, a green roof in Porto (Portugal) can be categorised as an “external building green” and be specified as “green roof”. However, nature-based solutions often belong to more than one urban setting and subdomain: as the development of a park can also include a creation of e.g. lakes (blue areas) or rain gardens (green areas for water management). Similarly to the previous question, guidance was provided to the data collectors in a Data Collection Guidance Manual on how to identify the specific setting of a nature-based solution.

**Which approach was used for the categorization of the ecosystem services?**

To identify the types of ecosystem services that a nature-based solution might provide, The Economics of Ecosystems and Biodiversity (TEEB) ecosystem services classification was considered. These include provisioning services, regulating services, habitat and supporting services, and cultural services. Besides the options of answers under each ecosystem service group, there was also an option for “other” examples of ecosystem services.

**How the addressed challenges, the provided ecosystem services or the project beneficiaries were identified**

As the research was based on the analysis of secondary sources presenting specific nature-based solutions, the addressed challenges, and the identified ecosystem services and group of beneficiaries were also derived via discourse analysis of the studied documents. With this approach, the analysis also considered the perceived or intended beneficiaries/challenges/services of nature-based solutions.

**Data Validation**

**Was the data collected subject to a quality control process?**

The collected data was verified in two stages. The first stage in parallel to the data collection and submission, while the data collectors submitted the questionnaires (June and August 2017).
Supervisors at CEU, Utrecht and Lund Universities checked all questionnaires for inconsistencies, questions that might have been forgotten, mistakes or incorrect input formats. After the data collection process was finished, specific questions were identified that could have a higher improvement potential and these were subject to further corrections by the database team at CEU. The second round of quality check was completed in January 2018.

**Limitations of the data collection process and the applied methodology**

While the data collection process aimed to identify up to 10 interventions per city, this was not always possible due to the lack of information. Moreover, project documents can be confidential, limiting access to available information. In some cities, the identified nature-based solutions were limited to certain types (e.g. small-scale green infrastructure projects funded from city participatory budgets, allotment and community gardens) or had a generally weak innovation level.

Beyond limited data availability, some methodological issues also had to be tackled. The accuracy of the reported data was highly dependent on the referenced information. In order to ensure consistency across the data collected, information collected through direct contact (e.g. phone calls, interviews) was not included in the database unless a document containing the obtained data that could be referenced was available. Further limitations resulted from the time scale of the project and occasional language barriers.

**Next Steps**

*Is an update to the collected data foreseen?*

In order to complete the Urban Nature Atlas to 1000 projects, additional nature-based solutions have been included between July and September 2018. During this additional data collection, attention has been given to identify projects in cities with only 8-9 NBS in the Urban Nature Atlas and including nature-based solutions studied in the other Naturvation work streams (https://naturvation.eu/cities). Otherwise no update is being planned.

*How the collected data can be used for analysis*

The online version of the Urban Nature Atlas is intended as a resource for policy makers, practitioners and those with a general interest in nature-based solutions. The excel version can be used for statistical analysis of the collected nature-based solutions and identification of general patterns (e.g. finance models, governance arrangements, stakeholder participation forms, impacts). The excel version of the database is intended for research users, and
the results may differ slightly from the results presented in the database report due to an additional round of data quality check performed between January-February 2018 to ensure that the data contained is suitable for research purposes.