



# NATURE-BASED SOLUTIONS LEARNING SCENARIO

Exploring ecosystem services and nature-based solutions  
to urban problems



Research and  
Innovation

## **Exploring ecosystem services and nature-based solutions to urban problems**

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EUROPEAN COMMISSION

# **NATURE-BASED SOLUTIONS LEARNING SCENARIO**

*Exploring ecosystem services and nature-based  
solutions to urban problems*

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## ABSTRACT

The purpose of this learning scenario is to explore an urban ecosystem of a city, analysing its ecosystem services and determining whether it acts as a nature-based solution (NBS) to challenges such as diminishing biodiversity, urban heat islands and urban decay. Although this learning scenario uses Uppsala as an example, it can be implemented using other cities and areas as a basis. Students are going to visit a green area (in this example: Rosendal) to understand better the role of ecosystem services and NBS. Rosendal is a new area in Uppsala specifically planned with a focus on ecosystem services.

To search for more information and examples, please refer to [Oppla – the EU Repository of Nature-Based Solutions](#).

## Keywords

Nature-based solutions, ecosystem services, green spaces; urban regeneration; natural science.

### 1. Introduction

*"Nature-based solutions (NBS) are solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services."*

[https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions\\_en](https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en)

To use this Learning Scenario more effectively, teachers are encouraged to:

- Check out the [list of recent EU publications on Nature-Based solutions](#)
- Read about [Nature-based solutions: Transforming cities, enhancing well-being](#) (also available as a PDF)
- Contact local NBS practitioners or scientists working in their area (they can be found through [Oppla](#)).
- Use the "[Ask Oppla](#)" service to request help in case of any technical/scientific question on NBS.

### 2. Overview

Overview	
<b>Subject</b>	Biology and natural science
<b>NBS topic</b>	Green spaces and urban regeneration
<b>Recommended age of students</b>	12–18 years old
<b>Preparation time</b>	180 min
<b>Teaching time</b>	180 min (3 lessons)
<b>Online teaching material</b>	N/A
<b>Offline teaching material</b>	Mobile phone, camera, and computer

Overview	
<b>NBS resources used</b>	<ul style="list-style-type: none"> <li>• <a href="#">Nature for cities project</a></li> <li>• <a href="#">URBES project - European Urban Biodiversity and Ecosystem Services (video)</a></li> <li>• <a href="#">Oppla case studies</a></li> <li>• <a href="#">Interview with EU policy officer about NBS</a></li> <li>• <a href="#">About Rosendal (information in Swedish)</a></li> <li>• <a href="#">Openness project</a></li> <li>• <a href="#">Nature based solutions evidence</a></li> <li>• <a href="#">Nature based solutions to address global societal changes</a></li> <li>• <a href="#">European Commission – NBS Definition</a></li> <li>• <a href="#">Millenium Ecosystem Assessment</a></li> </ul>

### 3. Integration into the curriculum

Lesson activities should include scientific methods such as formulating and seeking answers to questions, making systematic observations, planning and conducting experiments and field studies. Students are to be given opportunities to state their arguments and to present their analyses and conclusions. They will also be given the opportunity to use computers to process and present their findings. Students can perform the second part of the LS individually, if this LS is implemented online.

### 4. Aim of the lesson.

The aim is to explore existing ecosystem services and NBS in a city, while helping students to develop an understanding of the importance of green spaces in society and strengthen their ability to conduct experiments and communicate scientific results.

### 5. Outcome of the lesson

The outcome is one report per student on the ecosystem services and NBS (Rosendal) in Uppsala. Students will describe ecosystem services such as biodiversity enhancement, food provision (fruits and berries), pollination and recreation. They will also describe and discuss NBS like green roofs and façade greenery based on their systematic observations, planning and conduction of field studies.

### 6. Trends

Outdoor education: the learning scenario is an investigation outside of the school building in the “real” environment; Ecojustice pedagogy; Place-based Learning; Innovation.

### 7. 21<sup>st</sup> century skills

The students will develop skills such as collaboration, creativity, personal and social responsibility. They will be aware of what is needed to build a sustainable area in a city and develop an understanding of the importance of biology in society. Socio-emotional skills will be fostered, since the students need to collaborate in groups to explore ecosystem services in a city. “Real-world” problem-solving skills will be enhanced since they will answer complex questions and identify NBS in a city. Students need to state their arguments and to present their analyses and conclusions convincingly. Finally, digital competencies will be enhanced as the students will be given the opportunity to use computers to process and present their findings.

### 8. Activities

Activity	Procedure	Time
<b>Definition of ecosystem services and NBS</b>	Lesson 1: <ul style="list-style-type: none"> <li>• Lecture about the different type of ecosystem services and NBS. The different types of ecosystems are divided into</li> </ul>	50 min

Activity	Procedure	Time
	<p>supporting, provisioning, regulating or cultural. In this lesson, the teacher will use the following materials:</p> <ul style="list-style-type: none"> <li>• <a href="#">Nature for cities project</a></li> <li>• <a href="#">European Commission – NBS Definition</a></li> <li>• <a href="#">URBES project - European Urban Biodiversity and Ecosystem Services (video)</a></li> <li>• <a href="#">Millenium Ecosystem Assessment</a></li> <li>• <a href="#">Interview with EU policy officer about NBS</a></li> </ul> <p>2) Youtube: <a href="#">Nature-based solutions (Think Nature)</a>: <a href="https://www.youtube.com/watch?v=6rn6jOZ6Bs8">https://www.youtube.com/watch?v=6rn6jOZ6Bs8</a></p> <p>3) Game: <a href="https://game.think-nature.eu/">https://game.think-nature.eu/</a></p>	
<p><b>Investigation of ecosystem services and NBS in a city</b></p>	<p>Lesson 2: Visit a green area in a city (in this case Rosendal, in Uppsala) and conduct an investigation into ecosystem services and NBS. Rosendal is planned with a focus on ecosystem services. Some examples of ecosystem services are biodiversity enhancement (supporting), food (fruits and berries) (provisioning), pollination (regulating) and recreation (cultural). Examples of NBS include extensive, semi-intensive, and intensive green roofs, façade greenery/ vertical gardens, rain gardens and allotments.</p> <p>For online implementation, extra tools such as Google Maps could be used to 'visit' the green areas of the city. Another option for online implementation is to assign students to visit (with family members) a green area of the city during the weekend and provide a feedback on the next lecture.</p>	50 min
<p><b>Report from investigation of ecosystem services</b></p>	<p>Lesson 3: Report</p> <p>The outcome is one report per student on the exploration of ecosystem services and NBS in a city.</p> <p>The students are to consider ecosystem services and NBS based on the following questions:</p> <ul style="list-style-type: none"> <li>• Which nature-based solutions can you find in the area?</li> <li>• Which ecosystem services are provided by the area?</li> <li>• What is the main role of the identified ecosystem services? (e.g. supporting, provisioning, regulating and cultural)</li> <li>• Why do people need to learn more about ecosystem services and NBS?</li> </ul>	50 min

## 9. Assessment

Students will develop and hand in an individual report, to be considered in the assessment. The report will take the form of a summary (~600 words) of the ecosystem services provided in the analysed area. The students will have to formulate answers to the questions described above regarding ecosystem services and nature-based solutions.

Requirements to be assessed:

- Students describe the meaning of concepts (ecosystems services and nature-based solutions).
- The student analyses and seeks answers to complex questions.
- The student discusses complex questions concerning the importance of biology to individuals and the society.
- Students use scientific language.

## Getting in touch with the EU

### IN PERSON

All over the European Union there are hundreds of Europe Direct information centres.

You can find the address of the centre nearest you at: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

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You can contact this service:

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- at the following standard number: +32 22999696, or
- by email via: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

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<https://op.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en))

### EU LAW AND RELATED DOCUMENTS

For access to legal information from the EU, including all EU law since 1952 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

### OPEN DATA FROM THE EU

The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.

## About the NBS project

The NBS project is initiated and funded by the European Commission Directorate-General for Research and Innovation and coordinated by PPMI, in collaboration with European Schoolnet (EUN). PPMI ([www.ppmi.lt/en](http://www.ppmi.lt/en)) is a leading European research and policy analysis centre, aiming to help public sector and civil society leaders from around the world, presenting evidence in a way that is simple, clear and ready to use. European Schoolnet ([www.eun.org](http://www.eun.org)) is the network of 34 European Ministries of Education, based in Brussels. EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. Find out more about nature-based solutions: <https://ec.europa.eu/research/environment/index.cfm?pg=nbs> and all the NBS Learning Scenarios created in this project as well as the overall reports can be found at <http://www.scientix.eu/pilots/nbs-project>

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*Studies and reports*



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