



Augmented Reality (AR) Wildlife Conservation Expedition

STEM4inclusive schools
WP2 – Toolbox



Łukasiewicz

Institute for Sustainable Technologies

Hybrid Learning and Behavioural Economics Lab
Remigiusz Mazur

-1-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



Structure of the activity

A Introduction

B Training phase

about the topic

You will understand biodiversity and conservation challenges.

You will explore how AR can be used for wildlife education.

You will identify key endangered species.

about the training

You will learn how to use AR tools effectively.

You will understand data collection techniques.

You will prepare for the expedition with research and hypothesis development.





A: About the topic

What is Biodiversity?

-3-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



What is Biodiversity?

Biodiversity encompasses the variety of life on Earth, including different species, ecosystems, and genetic variations. It is essential for maintaining ecological balance and sustaining life. Biodiversity provides:

- A stable food chain that supports all living organisms.
- Essential resources such as medicine and raw materials.
- A natural buffer against climate change and disasters.

Without biodiversity, entire ecosystems can collapse, leading to serious consequences for humans and wildlife alike.



Importance of Wildlife Conservation

For Ecosystems:

- The preservation of natural habitats.
- The maintenance of key ecological interactions.

For Humans:

- Access to clean air and water.
- Sustainable use of natural resources.

For the Future:

- Protection of biodiversity for future generations.
- Encouraging responsible environmental behaviors.



Pixabay picture by Yolanda Díaz Tarragó – free licence



Introduction to Augmented Reality

Augmented Reality (AR) allows us to overlay digital information onto the real world, enhancing our interaction with the environment. In wildlife conservation, AR can:

- Help visualize endangered species in their natural habitats.
- Provide real-time educational content.
- Encourage users to engage in interactive conservation activities.



Pixabay picture by Gerd Altmann – free licence





Let's have a look at this
YouTube video!

Understanding Virtual Reality and Augmented Reality



<https://www.youtube.com/watch?v=vz0UUVdt2ps>

-7-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



AR Apps for Wildlife Exploration

To conduct this activity, you can use the following free AR apps:

- **Seek by iNaturalist:** Uses the camera to identify plants and animals.
- **WWF Free Rivers:** Explores how human actions impact river ecosystems.
- **Google Lens:** Provides instant information on wildlife species.





**Today you will start your wildlife conservation expedition
but before we start, you will:**

- Learn about conservation strategies and AR technology.
- Study species that will be explored using AR.
- Prepare a data collection plan and observation sheet.





How AR Enhances Wildlife Conservation

AR provides an engaging, hands-on learning experience by:

- Creating immersive environments for endangered species.
- Encouraging students to participate in real-world conservation efforts.
- Making data collection interactive and accessible to all learners.



How will we do this?



Pixabay picture by Agata – free licence





Conducting the AR Wildlife Expedition

- Select a local park, schoolyard, or green space.
- Use AR apps to locate species and record observations.
- Compare virtual data with real-world environmental factors.

-12-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



How to Support Inclusive Learning in this Activity

To ensure all students can participate effectively, we encourage:

- **You should be paired with different skill levels:** You can help each other with navigation and observation.
- **Provide alternative ways to document findings:** You can choose between written notes, voice recordings, or visual presentations.
- **Use adaptive AR tools:** Ensure that your friends with visual impairments have access to audio-based descriptions and haptic feedback.
- **Encourage teamwork:** Assign roles that play to your strengths, such as note-taking, AR interaction, or research.





How AR Can Make Learning More Inclusive

AR helps students with different learning needs:

- **Visually impaired students** can use audio descriptions of AR experiences.
- **Students with dyslexia** benefit from interactive visual aids instead of text-heavy materials.
- **Hands-on learners** can engage with 3D models rather than abstract concepts.





The Role of Ecosystems in Biodiversity

Ecosystems are communities of living organisms interacting with their physical environments. They provide essential services such as clean air, water, and soil. Healthy ecosystems:

- Maintain natural cycles, such as the carbon and nitrogen cycles.
- Support diverse plant and animal life.
- Help mitigate climate change by absorbing CO₂.



Human Impact on Endangered Species

Human activities such as deforestation, pollution, and overhunting have led to the decline of many species. Major threats include:

- 1. Habitat destruction:** Urban expansion, agriculture, and deforestation.
- 2. Pollution:** Chemicals and plastics harming wildlife.
- 3. Climate change:** Rising temperatures affecting migration patterns and food sources.



Pixabay picture by Silke – free licence





Let's have a look at this
YouTube video!

Human Impacts on Biodiversity

-17-



<https://www.youtube.com/watch?v=wXJiHr8jWBs>



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



Successful Conservation Programs

Many conservation programs have successfully protected endangered species. Examples:

- **Giant Panda Conservation:** China's efforts to restore bamboo forests led to an increase in panda populations.
- **Sea Turtle Protection Programs:** Nesting site conservation and anti-poaching laws have helped stabilize turtle populations.
- **Wolves in Yellowstone:** Reintroduction of wolves restored balance to the park's ecosystem.





The Use of AI and AR in Modern Wildlife Monitoring

Technology is transforming conservation efforts:

- AI-powered camera traps detect and track species in remote areas.
- AR applications help scientists visualize habitat changes.
- Machine learning predicts wildlife migration patterns to prevent conflicts.





How You Can Contribute to Conservation in Daily Life

Even small actions can help protect biodiversity:

1. Reducing plastic use to minimize ocean pollution.
2. Participating in tree-planting initiatives.
3. Supporting wildlife-friendly products and ethical brands.
4. Educating peers about endangered species.



Pixabay picture by Gerd Altmann – free licence





Practical Conservation Actions That You Can Take

1. Organizing clean-up events in local parks.
2. Volunteering at wildlife rehabilitation centers.
3. Fundraising for conservation organizations.
4. Engaging in citizen science projects.





The Importance of Sustainable Development in Protecting Wildlife

Sustainable development balances human needs with environmental conservation:

- **Eco-friendly urban planning** reduces habitat destruction.
- **Sustainable agriculture** prevents deforestation and soil erosion.
- **Green energy** reduces pollution and carbon footprints.





Challenges in Global Wildlife Protection Efforts

Despite conservation efforts, challenges remain:

1. Illegal wildlife trade endangers species like rhinos and tigers.
2. Conflicts between humans and wildlife due to shrinking habitats.
3. Lack of funding and political support for conservation programs.





Common Misconceptions About Wildlife Conservation

“Endangered species always recover once protected.”

Recovery takes decades and continuous effort.

Every action helps prevent species loss.

“Small conservation efforts don’t make a difference.”

“Only governments can make a change.”

Individuals and communities play a crucial role.

-24-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



Climate Change and Its Impact on Wildlife

Climate change is affecting:

- Migration patterns of birds and marine species.
- Coral reefs due to rising ocean temperatures.
- Food availability for many species.
- Natural disaster frequency, destroying habitats.



Case Study – The Amazon Rainforest



Pixabay picture by Turiano L P Neto – free licence

-26-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



The Amazon is home to over 10% of Earth's biodiversity:

1. Threatened by deforestation and illegal logging.
2. Indigenous groups fighting to protect the forest.
3. Conservation efforts focus on sustainable land management.

-27-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



How Technology is Revolutionizing Conservation

- GPS tracking to monitor wildlife movements.
- Drones to track poaching activities.
- AI-powered data analysis for population studies.
- AR for interactive conservation education.

-28-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



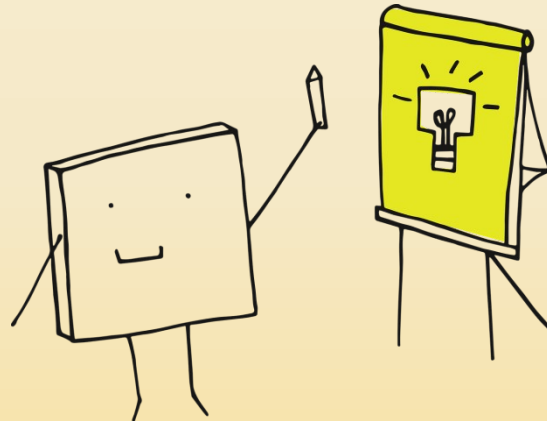
Co-funded by
the European Union



B: AR Wildlife Conservation Expedition

Training phase

-29-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



Your task:

- Use AR technology to explore virtual representations of endangered species in your local environment.
- You have 6 days.
- Work in groups and show the results to the others.



-30-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



DAY 1

1. Discuss in group the importance of wildlife conservation.
2. Select an AR app and explore its features.
3. Identify at least three endangered species to investigate.
4. Record your chosen species in Table 1.

DAY 2-3

1. Use AR apps to locate and study virtual wildlife.
2. Observe and record species details:
 - Habitat and geographical location;
 - Conservation status (endangered, critically endangered, etc.);
 - Threats and human impact;
 - Possible conservation solutions;
3. Take notes and screenshots for documentation.

-31-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union



DAY 4

1. Compare findings with your class.
2. Analyze human impact on species and potential solutions.
3. Answer the reflection questions which you will find at the end of your worksheet.

DAY 5-6

1. Summarize findings in a digital report, blog, or interactive presentation.
2. Include:
 - Species descriptions and conservation insights
 - Images/screenshots from the AR expedition
 - Conservation recommendations
3. Present your findings to the class.

-32-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union

H5P- Tasks:

I had a problem with preparing H5P... Could you please help me? I prepared the content...



Drag the Words – Conservation Concepts

Match the conservation concept to its correct description:

1. Endangered Species – A species at risk of extinction due to habitat loss or other factors.
2. Biodiversity – The variety of life in a particular habitat or ecosystem.
3. Habitat Destruction – The process by which natural environments are altered, affecting species survival.

Quiz – Wildlife Conservation and AR Technology

1. What is one advantage of using AR for wildlife conservation?
 - a) It allows people to hunt endangered species virtually.
 - b) It helps raise awareness by providing interactive experiences.**
 - c) It replaces the need for conservation programs.
2. Which of the following is NOT a major threat to biodiversity?
 - a) Climate change
 - b) Habitat protection programs**
 - c) Deforestation





Congratulation!

You mastered the activity on Augmented Reality Wildlife Conservation Expedition!

-34-



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by
the European Union