Community Science

Urban Wildlife

Lesson 9: Human Impact Mapping

Duration: 1 hour **Location:** Indoors/outdoors

Overview

In this lesson students will:

Read an article explaining the important role urban areas play in the future of global biodiversity. Then, explore their schoolyard/community ecosystem and identify local human impacts. Finally, students brainstorm green solutions and explore roles green infrastructure plays in conserving biodiversity.

Learning objectives

By the end of the session, students will be able to:

- Identify negative human impacts on the local ecosystem;
- Identify green solutions currently being used to mitigate these impacts; and
- Understand the role cities play in preserving global biodiversity.

Curriculum links

Grade: 9

Science, Biological Diversity

- Describe the relative abundance of species on Earth and in different environments.
- Describe ongoing changes in biological diversity through extinction and extirpation of native species, and investigate the role of environmental factors in causing these changes.
- Evaluate the success and limitations of various local and global strategies for minimizing loss of species diversity.

Equipment required

- ☐ Whiteboard (or equivalent)
- ☐ Whiteboard markers (or equivalent)
- ☐ Laptop or printed article
- ☐ Nature journals or blank paper
- ☐ Writing utensils
- ☐ Colouring pencils

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Additional information

In this lesson student will need a basic understanding of climate change, biodiversity, and citizen science.

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Lesson plan

Time	Activity	Equipment needed
10 mins	Have students read the following article about the role cities play in harming and saving global biodiversity. Urban Refuge: How Cities Can Help Solve the Biodiversity Crisis Janet Marinelli If not all students have a computer, please print out the PDF copy.	• Laptops OR printed articles
10 mins	Have the group discuss the 5 top points they took away from the article, write these on the board. Ideally, points should look similar to those below. • Traditionally, cities were seen and built without biological diversity in mind. • Some species are beginning to move back into urban areas and even thriving in their urban ecosystems. • Cities are now starting to adopt more 'green infrastructure' which is increasing their importance to local plant and animal species. (Green infrastructure examples: community gardens, green roofs, parks, storm ponds, etc.) • The healthier nature is in cities, the better human relationships are with nature and the more people will be inclined to protect the natural world. • Increasing nature in cities will help to protect/preserve global biodiversity, which is declining due to the impacts of climate change.	• Whiteboard (or equivalent) • Whiteboard markers (or equivalent)

	Identify how citizen science is an important tool for conservationists, scientists, and city planners. Citizen scientists that submit data from urban areas to projects such as, iNaturalist and eBird, help to inform government policy (laws and regulations), government planning (building, re-development and reclamation), and give scientists a better idea of the role cities can play in the fight against climate change.	
20 minutes	Provide students with a blank sheet of paper or their nature journals and writing utensils. Brainstorm examples of human impacts within cities. Encourage out of the box examples. Pesticides, increased temperatures, climate change, flooding, snow ploughing, salt from the roads, fertilizers, etc. Guide students on a walk around their schoolyard/community and have them map (with a legend) the different human impacts (direct and indirect) they see or feel.	• Nature journals or blank paper • Writing utensils
20 minutes	Discuss findings as a group and create a class list of community/schoolyard human impacts. Brainstorm as a class, or in small groups alternatives/solutions for the issues on the board. These can be things they can do (plant more flower), things they can stop doing (littering or driving slower), and things that the city/school/community association can do (increase park spaces, school gardens, bike lanes, green roofs, etc.) Green infrastructure is an excellent example of a local and global strategy looking to minimize the loss of species diversity. Green infrastructure is a network of high-quality green spaces and other environmental features that are designed and managed as a multifunctional resource. These resources can many environmental, economic and human health benefits.	• Whiteboard (or equivalent) • Whiteboard markers (or equivalent)

	Utilize the attached PDF PowerPoint presentations to further educate on what green infrastructure is, the benefits and real-life examples. Green Infrastructure and Biodiverse Design Green Infrastructure 101 Looking at current green infrastructure (GI) in cities, have students discuss and debate the following ideas. Where is GI successful? How has it/will it help urban ecosystems? Where is GI limited? Are these measures *really* enough, why or why not? Highlight citizen science as a new tool to better understand, educate, and solve many urban biodiversity issues.	

Extension

1. Based on everything they have just learned about:
   - the important role cities play in the future health of global ecosystems,
   - the negative ecological human impacts cities currently are having, and
   - the green infrastructure/lifestyle changes of the future.

   Have students create a new map of their schoolyard/community. This map will be a representation of what they picture the future of communities/schoolyards will look like. Encourage students to think beyond the technology of today and go as wild and innovative as they want!

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In the face of changing climates and decreasing global diversity, communities and governments are attempting to change the landscape of our urban environments. Encourage students to incorporate and label the green infrastructure solutions you discussed as a group. As well, in a section on the side of their map, jot down notes about lifestyle changes that are needed (less litter, no pesticide use, more walking, etc.).