

LESSON 8: HABITAT FRAGMENTATION AND SPECIES SURVIVAL

OVERVIEW:

Students will then consider a case study of a city that is planning for decreasing density. The ecological services model will be used to better understand the city’s approach to land use policies. Students will explore habitat fragmentation in order to explore different factors that influence species survival.

SUB-QUESTION:

How does habitat fragmentation impact species survival?

WAYS OF KNOWING URBAN ECOLOGY:



Students will...

Understand

- Understand that habitat fragmentation is the process where a large area of land is divided into two or more fragments or patches. (*ecosystem state and structure*)
- Recognize that greater fragmentation (e.g., greater patchiness and less connectivity) reduces the chances of species survival. (*ecosystem change, ecosystem state and structure*)

Talk

No specific goals connected with talking urban ecology in this lesson.

Do

- Analyze data of a fragmented landscape model to identify the effect of *population size, connectivity of patches, and species type* on species survival.
- Design corridors and patches for an urban landscape in order to increase the chances of species survival.

Act

No specific goals connected with acting on urban ecology in this lesson.

SAFETY GUIDELINES:

- None.

PREPARATION:

Time:

1 class period

Materials:

Activity 8.1

- Copies of the news story, “How To Shrink A City,” for each student (can be obtained at http://articles.boston.com/2010-09-05/news/29301717_1_cities-mayor-dave-bing-land-banks)
- Student “Ecosystem Services Model” sheets with blank areas for each student

INSTRUCTIONAL SEQUENCE**Activity 8.1: How to Shrink a City**

1. Tell your students that they will be reading a newspaper article which concerns social drivers, biophysical drivers, and land use, but in a way that many people do not consider.
2. Ask your students for a show of hands as to how many think that cities continue to grow over time forever. Ask for a few students to provide reasoning for their assertion.
3. Now ask students for a show of hands as to how many think that cities at some point will stop growing, or even start to shrink. Ask for a few students to provide reasoning for their assertion.
4. Tell your students that they will now consider the ecological systems model with regards to this question: “What do you do when human populations in cities shrink, not grow?”
5. Ask your students to complete the pre-reading activity for the article.

Teaching Alternative

The remainder of this activity may be done individually, in small groups, or as a whole class.

6. While students are reading through the news article, have them identify at least three elements that fit into each of the aspects of the ecosystem services model and have them list these elements on the work sheet.
7. For the “Drivers” section of the work sheet, make sure students include three biophysical and three social drivers from the article. Students may identify drivers that are introduced through the intervention of planners.

Instructional Strategy

Refer students back to the “Biophysical and Social Drivers” definitions hand-out from Lesson 2 of Module 2.

8. Once the article has been read and the drivers are identified, allow students time to revisit their pre-reading activity and make changes to their responses.
9. Have students fill out the section detailing what they would recommend given a shrinking human population, and allow time for discussion. Remind them of or bring out the city model that they constructed at the beginning of Module 1 as a way to think about this. You may point out hypothetical areas on the model that is shrinking in the way described by the article.
10. During or immediately after the discussion, ask your students to write down new ideas or interesting points from other students that arose during the discussion.

Teaching Alternative

You may allow students to skip writing down their recommendations and instead lead a class-wide discussion instead.

Concluding the Lesson

1. Ask your students if the ecosystem services model they filled out based on the article entitled “How To Shrink A City” would be any different if they instead read an article entitled “How To Grow A City.” Allow your students to discuss their responses, and ask them to provide their reasoning for their responses.
2. Tell your students that they will be working on an environmental action plan dealing with land use in the next lesson.